TECHNOLOGY DEPT.

Gas Journal

VOL. 281 107TH YEAR. LONDON, JANUARY 5, 1955. NO. 4779. PRICE 1/3

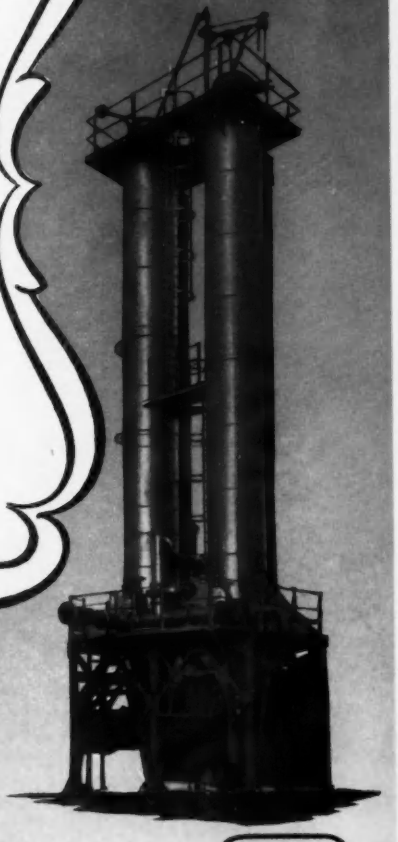
A CENTURY OF PROGRESS

PUBLIC LIBRARY
JAN 19 1955
DETROIT

1855

In 1855 Robert Dempster, a young Gas Engineer, founded at Elland a small Works for the production of all types of Gas Works Plant.

Today the business has grown into an organisation known throughout the entire Industry, playing its part in the field of technical advancement.



1955

ROBERT DEMPSTER & SONS LTD. ELLAND, YORKS.

DE
DEMPSTER · ELLAND

GASHOLDERS · PURIFIERS · HORIZONTAL CARBONISING PLANT

CONDENSERS & STATIC WASHERS · MECHANICAL HANDLING PLANT FOR COAL, COKE & OXIDE

R v.281 Ja-Mr '55

FIG. 150

modern H.P. design

Double-faced Modern H.P. Design. Corrosion Resisting Steel Door. Special Resilient Non-Metallic Composition Seats. Self-Lubricated. Seats enclosed and protected from Dust and Dirt in both Open and Closed Positions. Simple and Robust in Construction. Positive in operation. No Internal Operating Mechanism exposed to Gas Stream. No Wedges or Springs. Cannot Jam—Open or Closed. Spindle can be Repacked in the Open or Closed Position. Standard Test Pressure 100 lbs. per Sq. In. Air. Internal or External Screw with or without Indicator. Can be Adapted for Under-Pressure Connections. A High Pressure Valve at a Low Pressure Price. Sizes 3" to 24" Horizontal and Vertical.

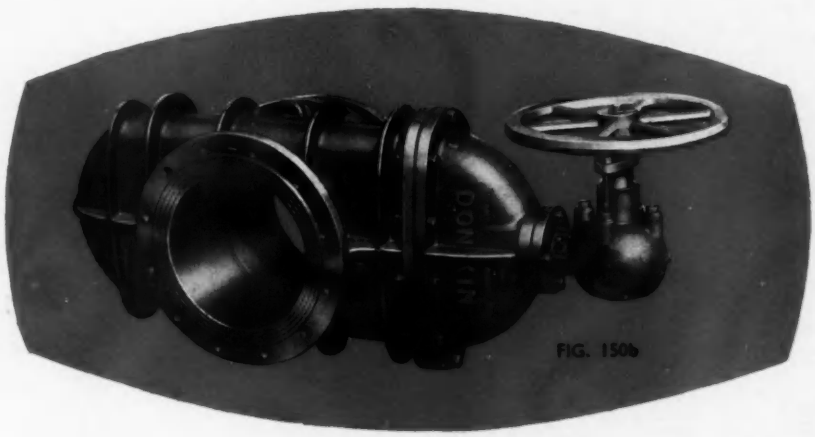


FIG. 150b

THE BRYAN DONKIN COMPANY LIMITED

CHESTERFIELD · (TEL : 3153) · LONDON

Makers of Gas Valves for over 100 Years

Tech

BY-PRODUCT PLANT

WELDED STEEL BENZOLE SCRUBBERS AND COOLER

supplied to the order of Woodall-Duckham Construction Company Ltd. at the Stanton Ironworks

Your orders and enquiries will be welcomed by:

R. & J.

DEMPSTER

Ltd.

Constructional Gas and Chemical Engineers

GAS PLANT WORKS · NEWTON HEATH

MANCHESTER · 10

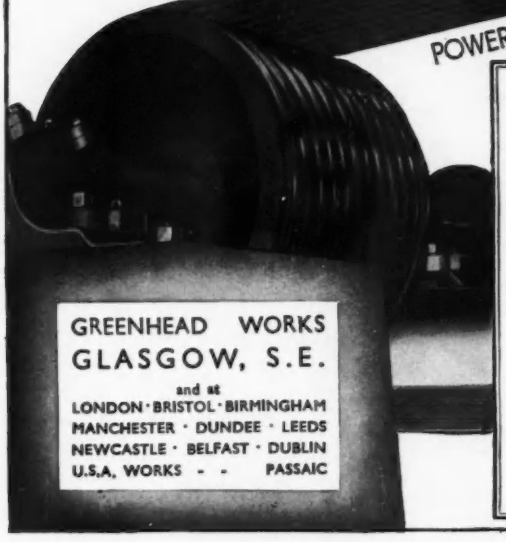
London Office: 34, VICTORIA STREET, S.W.1.

We make:— BY-PRODUCT and CHEMICAL PLANT · CONDENSERS · DETARRERS · GASHOLDERS · GAS VALVES and CONNECTIONS · IRON CASTINGS · PURIFIERS · STILLS · TANKS · WASHERS · WELDED & RIVETED STEELWORK

A

R.& J. DICK LTD.

POWER TRANSMISSION SPECIALISTS



GREENHEAD WORKS
GLASGOW, S.E.
and at
LONDON · BRISTOL · BIRMINGHAM
MANCHESTER · DUNDEE · LEEDS
NEWCASTLE · BELFAST · DUBLIN
U.S.A. WORKS - - PASSAIC

Manufacturers of :-

"DICK'S ORIGINAL" BALATA Belts
For all general purpose drives

"DIXEL" VEE ROPES
Made endless or open for drives up to 3 000 H.P.

"DIXIT" Belting
Acid and Heat Resistant

"RUBERIX" BELTING
Solid Woven from "Filastic" yarn Vulcanised

"DIXADD" BELTING
Combination Belt giving extra power

"DICKROPE"
RUBBER, MOULDED, ENDLESS

Catalogues and Price Lists on application

E. C. & J. KEAY, LIMITED

CONSTRUCTIONAL ENGINEERS AND IRONFOUNDERS

Head Office:
"Runnymede,"
Stratford Road,
Henley-in-Arden,
Warwickshire

Also Offices at
LONDON
SOUTHAMPTON

Cast Iron Purifiers temporarily erected in our Works prior to despatch

Specialists in Tanks, Steel or Cast-Iron, Riveted or Welded, etc.

JAMES BRIDGE WORKS, DARLASTON

THE TORCH OF INDUSTRY

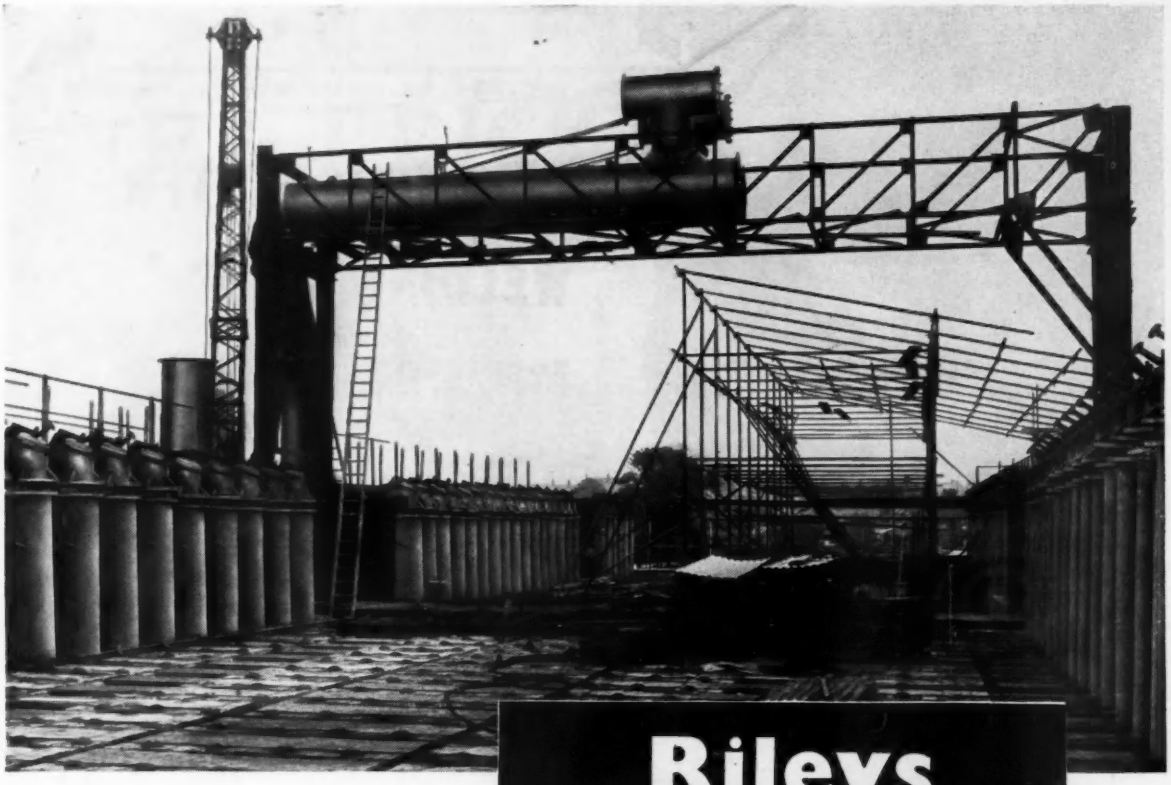
NOW 40 % FASTER WELDING OF MILD STEEL WITH ARGONAUT

Mild steel can now be welded far more speedily than ever before. The B.O.C. Argonaut process—already established as the speediest and most successful method of welding aluminium and stainless steel—has been developed to give the same proportionate increases in speed and efficiency in the welding of mild steel. Argonaut welds 40 per cent. faster, and, because there are no delays for electrode changing, this increased speed can be maintained throughout the whole welding operation.

Here Argonaut is being used to weld a steel barge built by the Thames Steam Tug & Lighterage Co. Ltd. Butt welds on semi-killed boiler quality steel and fully-killed pressure vessel steel have been found to have a greater strength than the parent metal. For further details and full technical information write to your nearest B.O.C. Branch.

BRITISH OXYGEN COMPANY LIMITED

LONDON & BRANCHES



Rileys of Batley

5 Unit Tubular Condenser
10' high. Weight 4½ tons.

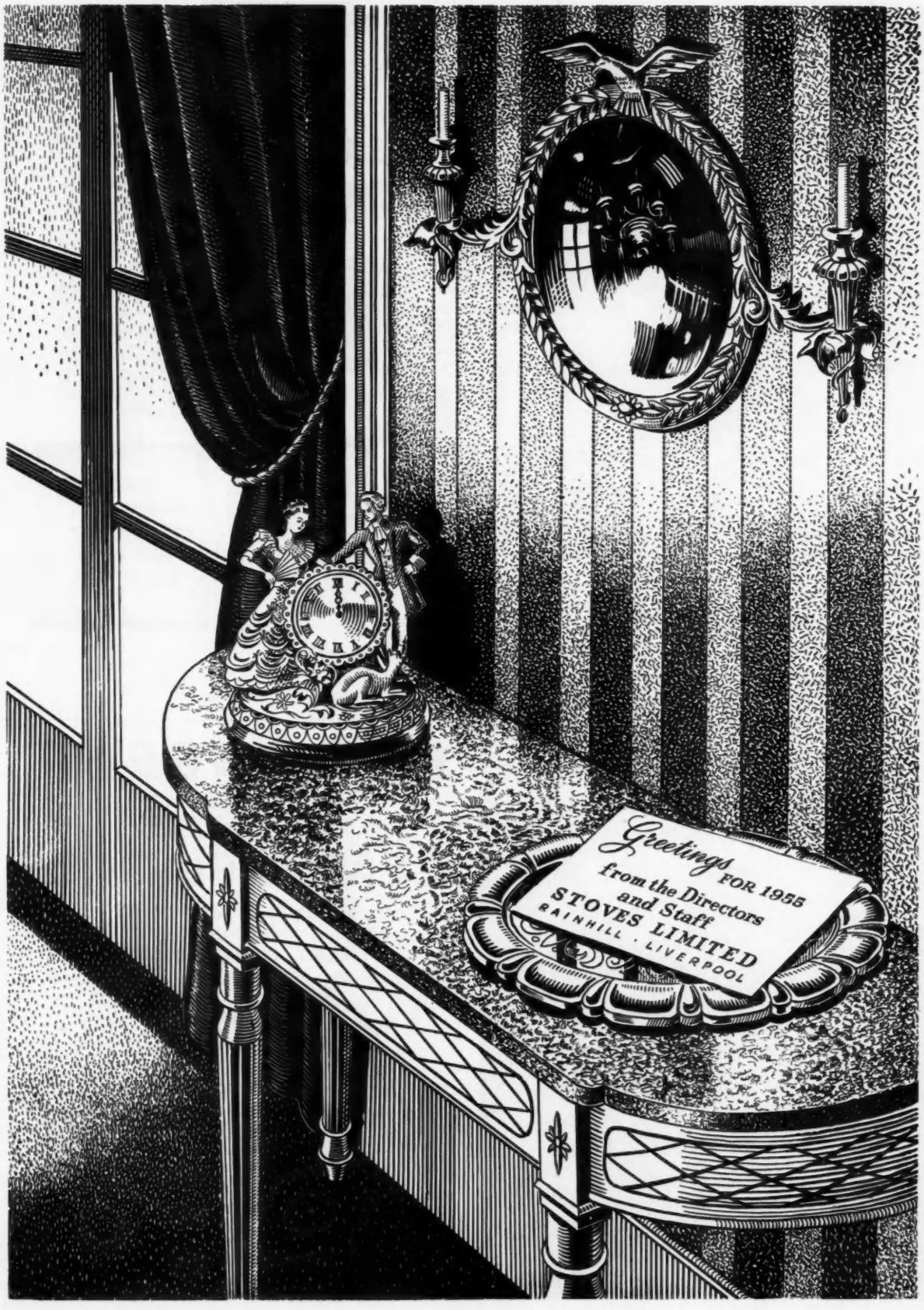
Engineers to the Gas and Allied Industries

Also specialists in the production of welded fabrications, riveted work, etc.

The above illustration (shown by permission of the Woodall Duckham Construction Co. Ltd). shows the erection of the offtake and suction mains over the battery and the pullman valves and ascension pipes to the collecting mains. In the background scaffolding has been erected for a temporary roof over the battery. We invite your enquiries whether they be for construction work, extensions, or entirely new installations. We have 65 years of specialised experience.

A. J. RILEY & SON LIMITED
VICTORIA WORKS, BATLEY, YORKSHIRE
Telephone: Batley 657 (3 lines). Telegrams: Boilers, Batley.

IN ASSOCIATION WITH JAMES AUSTIN & SONS (DEWSBURY) LTD.


Greetings FOR 1955
from the Directors
and Staff
STOVES LIMITED
RAINHILL · LIVERPOOL

Kitchen-wise women choose

Vulcan

The glass door cooker with the *Extra* features!

Popular though it is, the non-misting glass door is but one reason why so many women decide on a VULCAN. They see the handy plinth drawer . . . self-locating grill pan . . . easy-to-clean finish inside as well as out. With its smooth-fitting, light-weight parts, the VULCAN is so easy to look after!

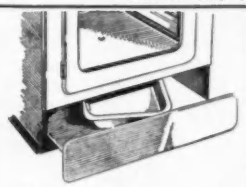
- *Fully-guaranteed Armourplate glass door.*
- *Retains full oven heat, can't steam over.*
- *Automatic regulator gives* double control.
- *Roomy plinth drawer.*
- *Self-locating grill pan.*
- *Fully-furnished oven.*
- *Good choice of finishes and oven capacities.*

Vulcan *DOUBLE-CONTROL* GAS COOKERS

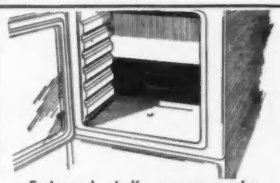
THE VULCAN STOVE CO. LTD · EXETER

Telephone: EXETER 5301-2 *Telegrams:* VULCAN EXETER

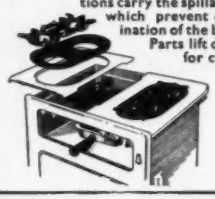
Associated Company of United Gas Industries Ltd.



The Vulcan's plinth drawer is really useful for getting pans, shelves and utensils out of the way.

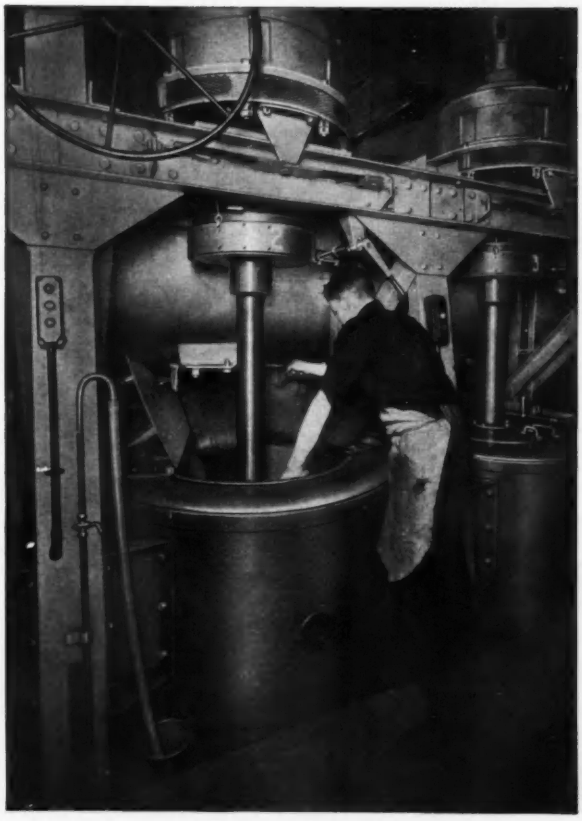


Embossed shelf runners make "gates" unnecessary. An occasional wipe with a damp cloth keeps this oven spotless.



Vitreous enamelled hot-plate sections carry the spillage pans, which prevent contamination of the burners. Parts lift off easily for cleaning.

***Point out these Vulcan advantages* YOUR SALES WILL BENEFIT!**



BROADBENT

HIGH SPEED

CENTRIFUGALS

STANDARD TYPE MACHINES
DRIVEN BY
DIRECT COUPLED MOTOR
OR
SEPARATE MOTOR
WITH
BOTTOM DISCHARGE
BASKETS
FABRICATED FROM
MILD STEEL, STAINLESS STEEL
MONEL, COPPER, ETC.

80 Years' Reputation for Reliability

THOMAS BROADBENT & SONS, LTD.
HUDDERSFIELD

DISTRICT OFFICES AT
LONDON · BRISTOL · LEICESTER · MANCHESTER · NEWCASTLE

POPULAR ILLUSIONS. No. 1

. . . but it's no illusion that

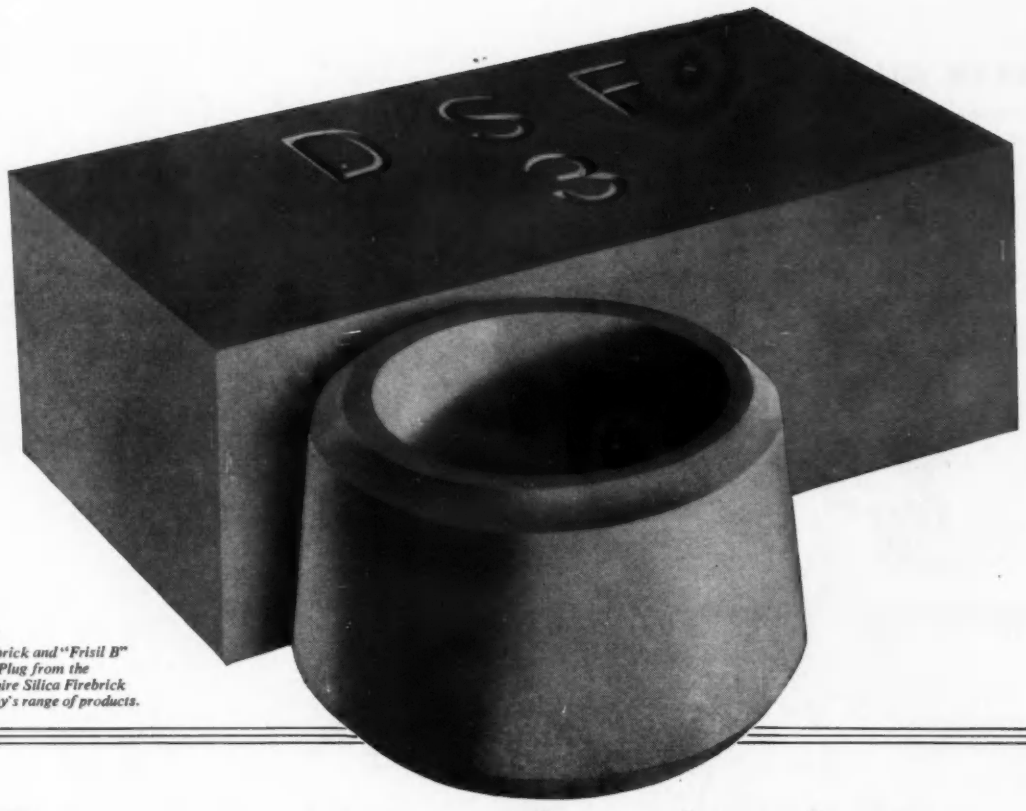
GEORGE COHEN'S
are the best people
FOR SCRAP!

GEORGE THE 600 GROUP OF COMPANIES **COHEN**
SONS AND COMPANY LIMITED

Experts in Scrap since 1834

BROADWAY CHAMBERS, LONDON, W.6.
Tel: Riverside 4141. *Grams:* Coborn, Telex, London
And at 600 Commercial Road, E.14 · Bidder Street, Canning Town, E.16 · Bath · Belfast · Birmingham Hebburn-on-Tyne · Leeds · Luton · Manchester Sheffield · Swansea.

GJ/543/x178



D.S.F.3
Square brick and "Frisil B" Nostril Plug from the Derbyshire Silica Firebrick Company's range of products.

The greater the insistence on furnace efficiency, the greater the need for

DERBYSHIRE SILICA REFRACTORIES

DERBYSHIRE "S" and "D.S.F."
(*90% Silica*)

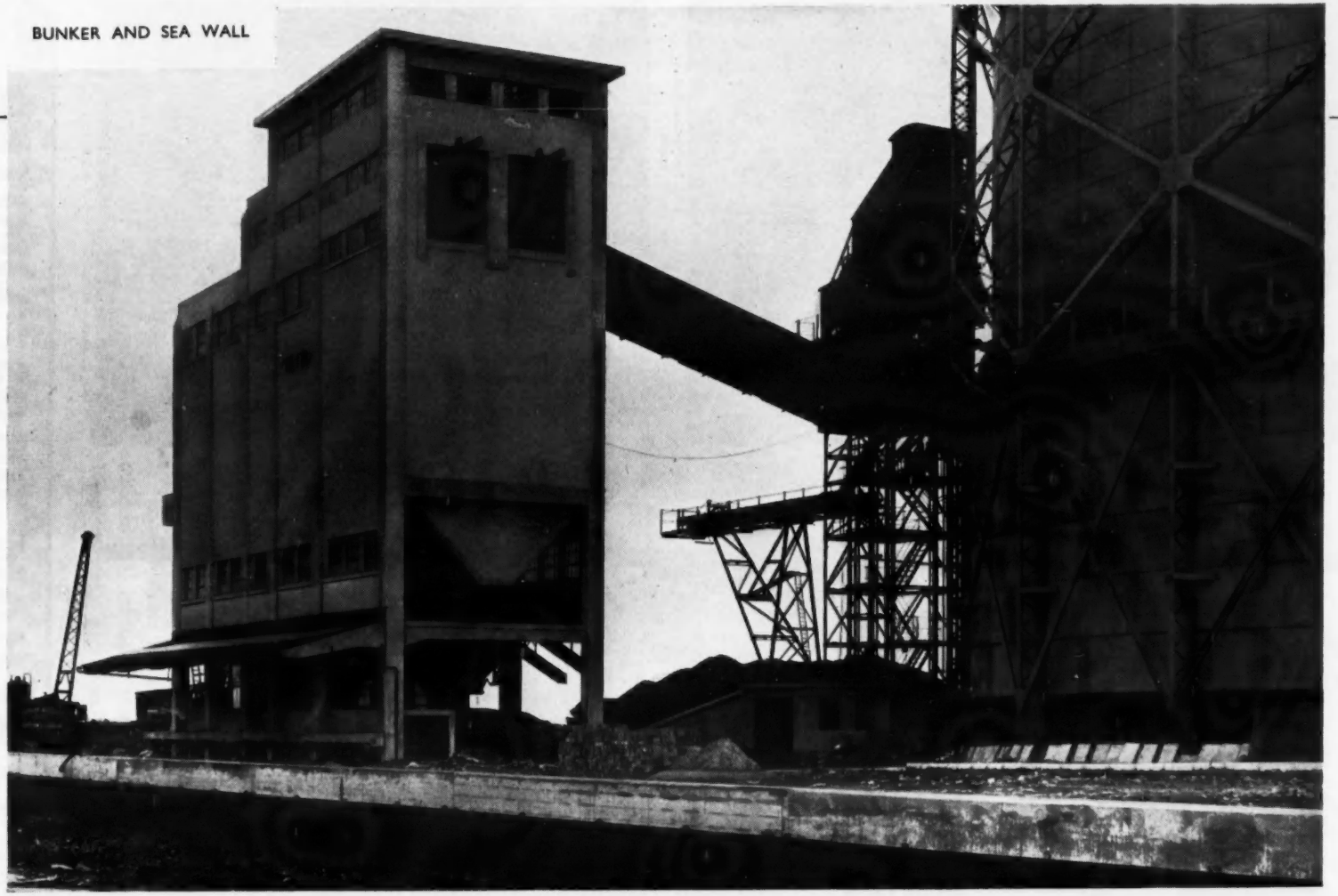
Refractories for all purposes including Vertical and Horizontal Retorts, Soakers, Puddling Furnaces, Reheating and Annealing Furnaces, Forge Furnaces, Checkers, Cupolas and Glass Furnaces.

Other D.S.F. products include
PEAKSIL (*95% Silica*) FRISIL (*Sillimanite*)
DUROSIL
(*The new British Plastic Refractory*)
and DOME INSULATION (*Diatomite*)

DSF
DERBYSHIRE SILICA FIREBRICK CO., LTD.
FRIDEN · HARTINGTON · NEAR BUXTON · DERBYSHIRE
Grams: Silica, Friden, Hartington. 'Phone: Youlgrave 271 (3 lines)

T.A. 4273

BUNKER AND SEA WALL



Consulting Engineers for the Coke Bunker :
Messrs. Coignet and Partners

South Eastern Gas Board

Main Contractors for the Coke Handling Plant :
Messrs. Robt. Cort & Son, Ltd.

CROWLEY RUSSELL & CO. LTD. 131, VICTORIA STREET, LONDON,
CIVIL ENGINEERING CONTRACTORS S.W.1
Telephone : **VIC. 7788**

RECENT CLAPHAM INSTALLATIONS AT BRADFORD

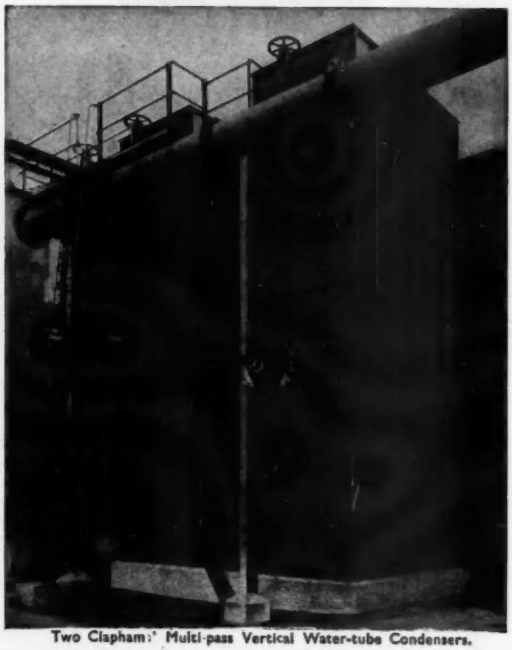
For over 100 years we have been serving the Gas Industry and the illustrations show equipment recently installed for the North Eastern Gas Board at Birkshall Works, Bradford.

Manufacturers of

- Condensing Plant
- Tar Extractors
- Washers (Pumpless Patent)
- Oxide Purification Plant
- Boxless Purifiers (Prov. Pat.)
- Liquid Purification Plant
- Mechanical Handling Plant
- Coke and Pan Ash Washers
- Purifier Control Valves
- Gas Pre-Heaters
- Briquetting Plants
- Refractory Brick Making Plant
- Special Pipes and Connections in cast iron and steel

Two Clapham-Barwick Pumpless Static Ammonia Washers

Internal deck level view of the Purifier Installation. (Eight 45 Feet Square Boxes.)



Two Clapham-Multi-pass Vertical Water-tube Condensers.

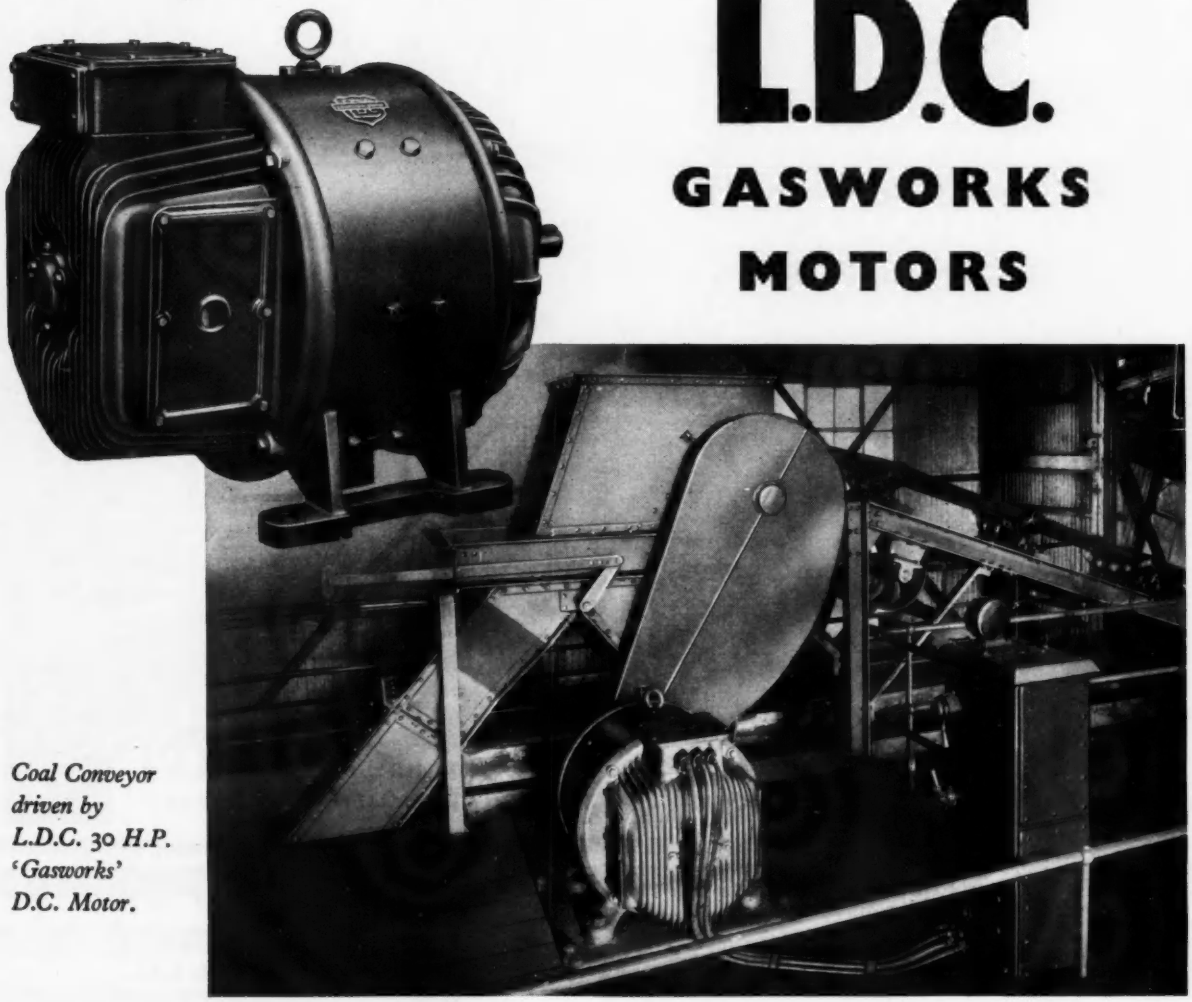
CLAPHAM BROS. LIMITED
MAKERS OF GAS WORKS EQUIPMENT SINCE 1837
KEIGHLEY · YORKS Tel: 2787-2788-Grams: 'Clapham Bros. Keighley'

For long trouble-free service

-anywhere in Gas Works

L.D.C.

GASWORKS MOTORS



Coal Conveyor driven by L.D.C. 30 H.P. 'Gasworks' D.C. Motor.

Wherever the going is tough—in fumes and grit, moisture-laden atmosphere, or fine dust and powder—you will find L.D.C. 'Gasworks' motors, chosen for their ability to withstand rough and arduous usage.

Robust construction plus 'extra' features including dust-tight terminal boxes and dust excluders on extended shafts, ensure reliability under the arduous conditions which prevail in Gas Works.

LANCASHIRE CRYPTO

THE SYMBOL OF POWER IN INDUSTRY FOR OVER 50 YEARS

LANCASHIRE DYNAMO & CRYPTO LTD

TRAFFORD PARK, MANCHESTER 17 · ACTON LANE, WILLESDEN, LONDON, N.W.10

London & Export Office: ST. STEPHEN'S HOUSE, VICTORIA EMBANKMENT, WESTMINSTER, LONDON, S.W.1

F.9.

HUWOOD

OXIDE HANDLING
THE MODERN WAY

OXIDE HANDLING TRANSPORTER
WITH COVER LIFTING EQUIPMENT

Special Features of this plant :

- Elevator in Aluminium
- Gravity-weighted Cable Reeling Drum
- Abrasive Rubber Covered Belt Idlers
- Cover Over Loading Operations
- Anti Corrosive Treatment of Structure

MECHANICAL HANDLING PLANT FOR THE COKE AND GAS INDUSTRIES

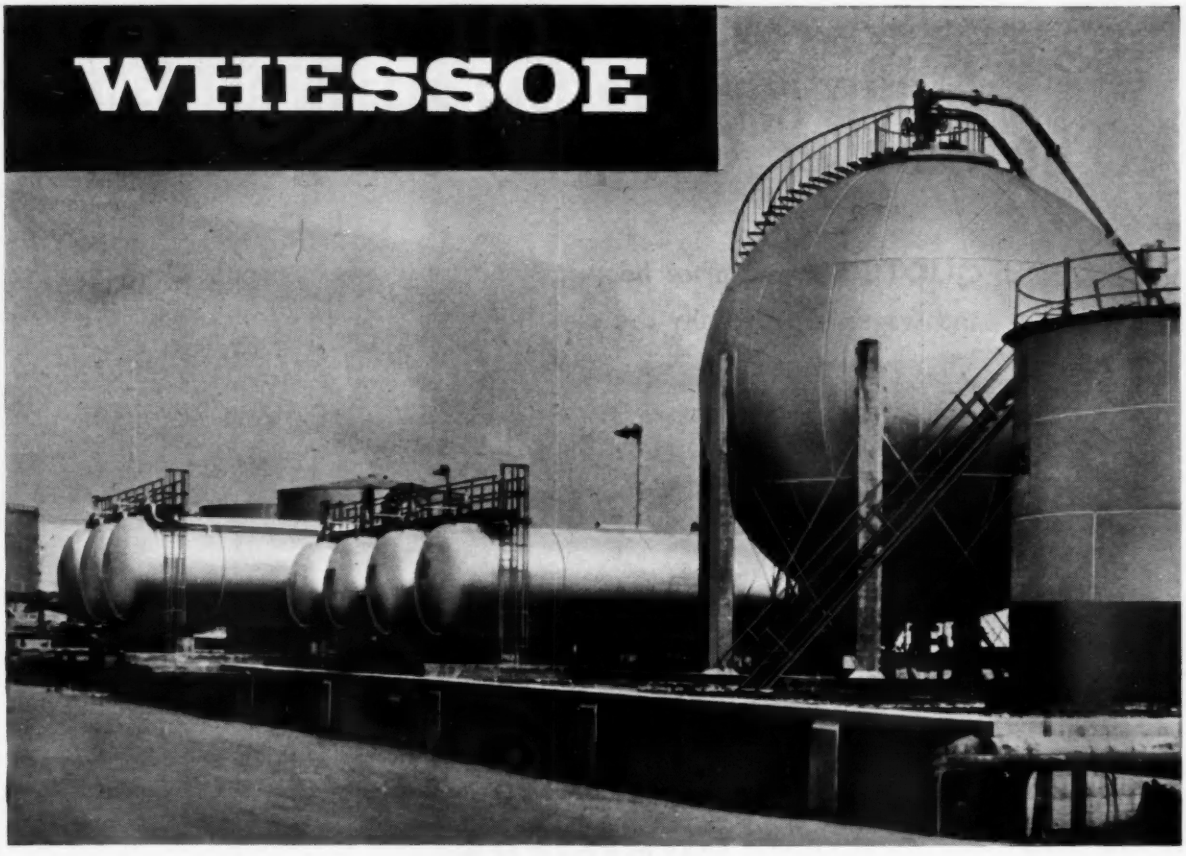
Head Office and Factories : HUGH WOOD & CO. LTD. GATESHEAD-ON-TYNE, 11

Telegrams : HUWOOD, GATESHEAD. *Telephone :* LOW FELL 76083 (5 lines).

Industrial and Export Office : DASHWOOD HOUSE, 69, OLD BROAD STREET, LONDON, E.C.2.

Telegrams : HUWOOD AVE, LONDON. *Telephone :* LONdon Wall 6631-2-3

WHESSOE



Propane and Butane Storage

Storage tanks for liquid petroleum gases are supplied by Whessoe and range from large site-built cylinders and spheres for static storage, to standard containers of 5 and 1 ton capacity for transport or local storage purposes.

These vessels are manufactured to the appropriate code of construction (including X-ray and stress-relief when required) and supplied with all necessary fittings.

WHESSOE *FOR LIQUID GAS STORAGE*

AN ADVERTISEMENT OF WHESSOE LTD · DARLINGTON · TEL 5315 · LONDON OFFICE 25 VICTORIA ST. LONDON SW1 · TEL ABBey 3881

W60

Associated with Stokes Castings Ltd.

The Smaller Company can generally

1. **QUOTE** a lower price because, whilst the cost of materials and wages is practically the same for all, its overhead charges are unquestionably under closer control.
2. **GIVE** a better delivery because its erection staff is limited in number and it is therefore a physical impossibility to accept more orders than it can cope with. In other words, it knows its limitations.
3. **GIVE** each contract personal attention.

We submit these important points for the consideration of Engineers sending out their enquiries for Gas Works Ancillary Plant.

PURIFIERS
WASHERS
PREHEATERS
CONDENSERS
BENZOL PLANTS
TAR EXTRACTORS
TANKS AND CONNECTIONS

KIRKHAM, HULETT & CHANDLER LTD.

Union Foundry, Mansfield Tel. 1256-7

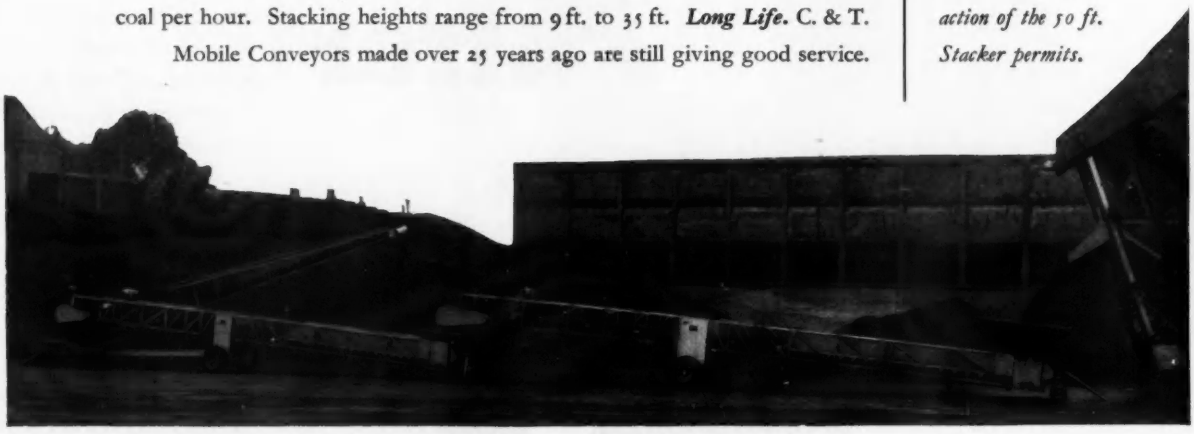
London Office: Stafford House, Norfolk Street, Strand, W.C.2 Tel.: Temple Bar 9910

SWIVELLING WHEELS SAVE STACKING TIME

No need to waste time changing the position of the horizontal feed conveyors when stacking with C. & T. Super-Mobile Stackers. When a new discharge point becomes necessary the Stacker alone is moved. Its swivelling main wheels permit a radial movement of the discharge point without alteration of the feed point and this feature enables large stacks to be built up with the minimum possible movement of conveyors. Other outstanding features of C. & T. Stackers are :—

High Mobility. They are instantly available for towing any distance along the highway. ***Wide Capacity Range.*** C. & T. standard machines are built in a number of types with capacity ranging from 50 to 300 tons of coal per hour. Stacking heights range from 9 ft. to 35 ft. ***Long Life.*** C. & T. Mobile Conveyors made over 25 years ago are still giving good service.

In each of the adjoining photographs, the two 50 ft. C. & T. Horizontal Conveyors are seen to be in the same position, but note the wide area of discharge which the radial traversing action of the 50 ft. Stacker permits.



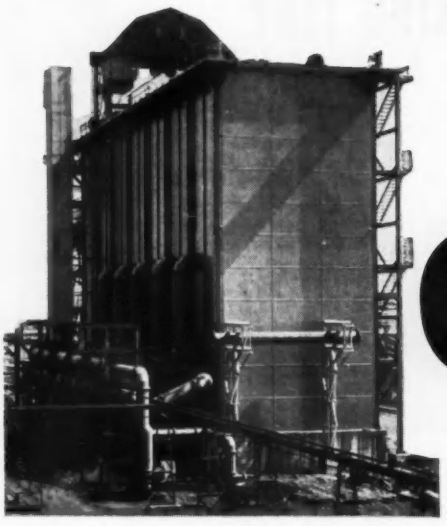
CRONE & TAYLOR (ENGINEERING) LTD.

SUTTON OAK, ST. HELENS, LANCS. TELEPHONE: ST. HELENS 3397

Full particulars of this fast operating equipment will be sent on request.

GT.4267

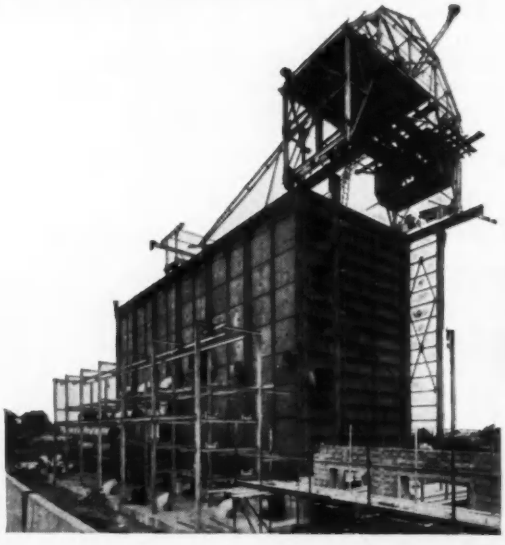
These Tower Box Purifiers are going up



One

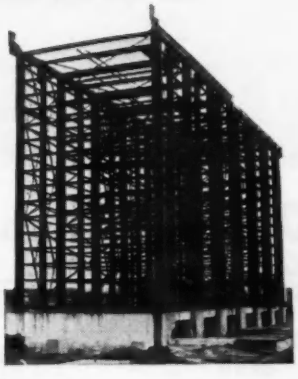
The first large Balfour-Lecocq Tower Box Purifier was completed at Rotherham. Its capacity soon to be doubled to 20,000,000 cu. ft. per day. A second purifier of 7,500,000 cu. ft. per day nears completion at Southall. The foundations are laid for a third at Bow Common.

The main reasons for the ready adoption of the Tower Box purifier are because it has fool-proof jointing between trays, and is fully mechanised. By adoption of special arrangement of connections the changeover of Towers can be effected easily in a few minutes.



After

The unequalled technical resources of the Balfour organisation are at the service of those requiring detailed information on application of Tower Box purifiers or other gas equipment to their needs.

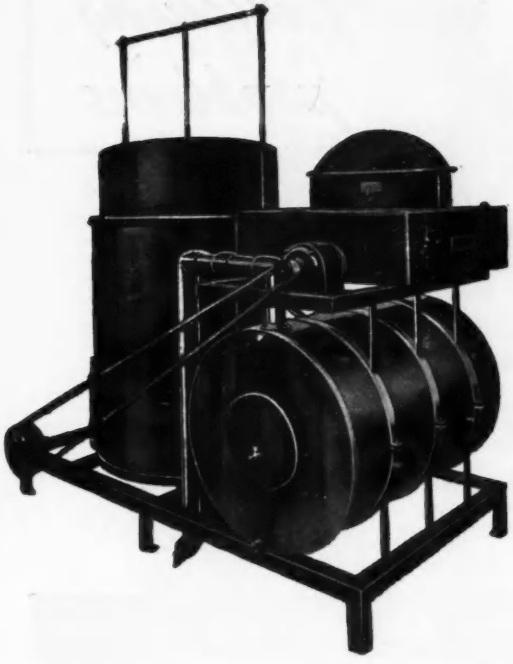


Another

Balfour OF LEVEN

HENRY BALFOUR & COMPANY LIMITED Artillery House, Westminster, London & Durie Foundry, Leven, Fife
MEMBER OF THE BALFOUR GROUP OF COMPANIES

AEROGEN GAS GENERATORS



PETROL AIR : 300 B.T.U. per cubic foot
PRODUCER AND PETROL COMBINED :
480 B.T.U. per cubic foot

Suitable for Domestic Commercial and Industrial Appliances at Home or Abroad where Town's Gas is not readily available.

Outputs of Plants Range from 100 Cubic Feet to 15,000 Cubic Feet per hour

Full technical information can be obtained from:

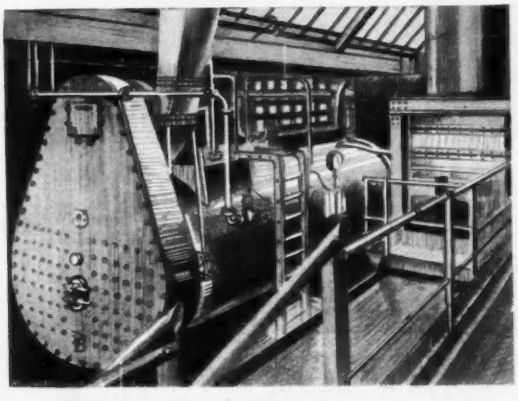
THE AEROGEN CO. LTD.,
ALTON, HAMPSHIRE, ENGLAND

Telegrams: Aerogen, Alton, Hants. *Telephone: Alton* 2081

Fuel Saved

is the main criterion of

Spencer - Bonecourt



Waste Heat Recovery Systems

Already more than 3,500,000 tons of fuel are saved annually by Spencer - Bonecourt installations designed to meet the needs of diverse industries. A survey of your Works might reveal possibilities of a major reduction in the fuel account to your own and the national advantage.

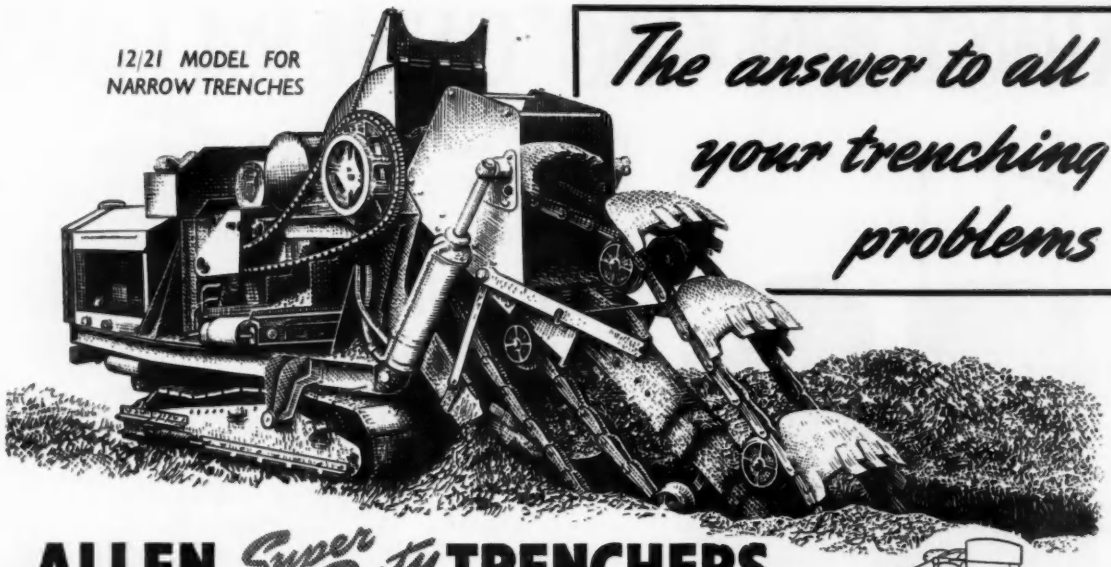
A Spencer - Bonecourt Specialist is at your service, **NOW.**

SPENCER - BONECOURT LTD., 14, Fetter Lane, London, E.C.4

Telephone : CENtral 0481/2 Telegrams : "Bonecourt, Fleet, London"

DETROIT PUBLIC LIBRARY

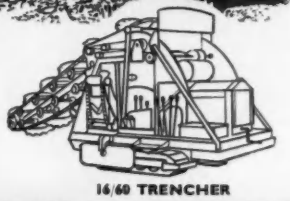
12/21 MODEL FOR NARROW TRENCHES



The answer to all your trenching problems

ALLEN *Super Duty* TRENCHERS

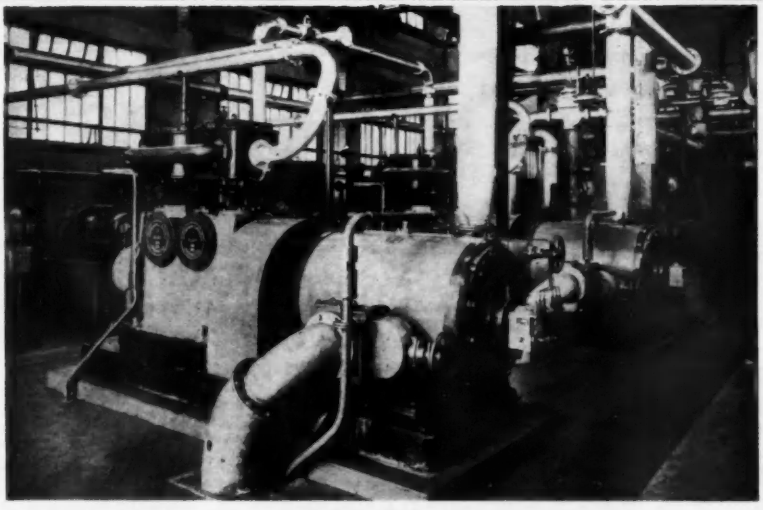
For narrow trenches we supply the 12/21 model, and for wide trenches the 16/60 model. Both models are a fine engineering job and capable of standing up to continuous hard work. We shall be pleased to send you further information and fully illustrated brochures on request.



16/60 TRENCHER

JOHN ALLEN & SONS (OXFORD) LTD. COWLEY OXFORD *Tel 77155/6/7*

STEAM ENGINE DRIVEN ROTARY GAS BOOSTERS



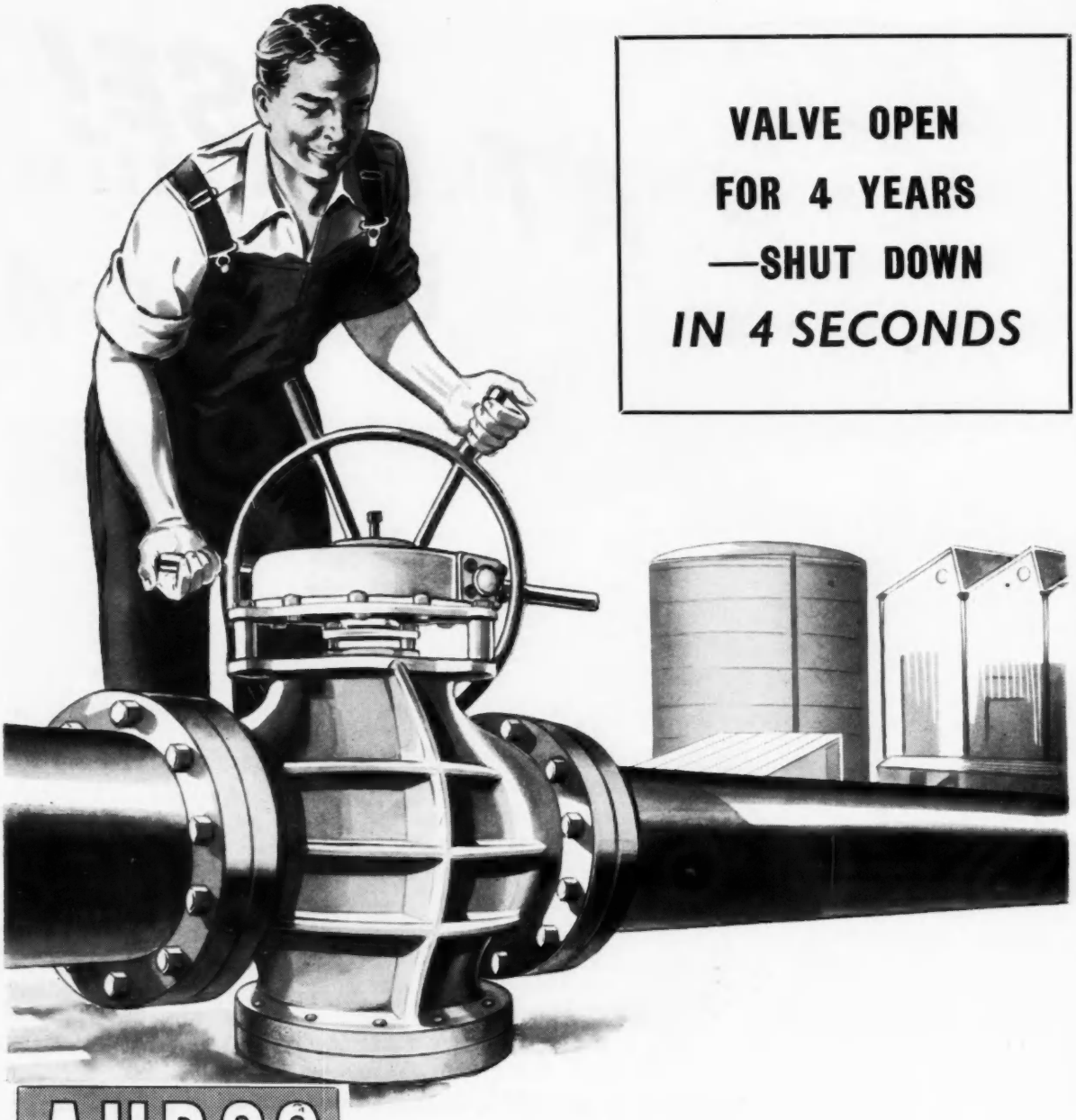
IN SERVICE 24 HOURS PER DAY BOOSTING ABOUT 1,250,000 CUBIC FEET PER DAY OF PURIFIED COKE OVEN GAS TO 13 LBS. PER SQUARE INCH PRESSURE FOR LONG DISTANCE TRANSMISSION FROM BIRCOTES NEAR DONCASTER TO WORKSOP.

By courtesy of the National Coal Board. (Carbonisation Branch, East Midlands Division)

London Office:
119, Victoria Street, S.W.1
Telephone: VICtoria 2612

WHITTAKER HALL & CO. (1929) LTD.

Sole Proprietors of R. S. Wittig & Co. (Compressors) Ltd
(DEPT. G.J.) BLACK LANE WORKS, RADCLIFFE, MANCHESTER.
Phone: RADcliffe 2421-2. Grams : Clutch, Radcliffe Manchester.



VALVE OPEN FOR 4 YEARS —SHUT DOWN *IN 4 SECONDS*

AUDCO
Lubricated
VALVES

One lubricant for all valve services plus grease gun lubrication plus simple lubrication schedules gives good valve performance and long life at low cost. This is made practicable by Audco Lubricant No. 631, a recent development now field proved. It has excellent lubricating properties, very wide temperature range and resistance to most pipeline fluids and gases.

When the call is for quick action, particularly in the distribution of inflammable, natural and coal gases, valves must operate and must shut off tight. Audco Valves are chosen for such difficult services. Their fundamental design ensures a tight shut off; their lubrication system provides an insurance of operation.

Where it is a question of inflammable gases — coal gas, natural gas, refinery gases, liquified petroleum gases — the specification is most often Audco Lubricated Taper-Plug Valves.

AUDLEY ENGINEERING CO. LTD. - NEWPORT SHROPSHIRE

AT EASE!

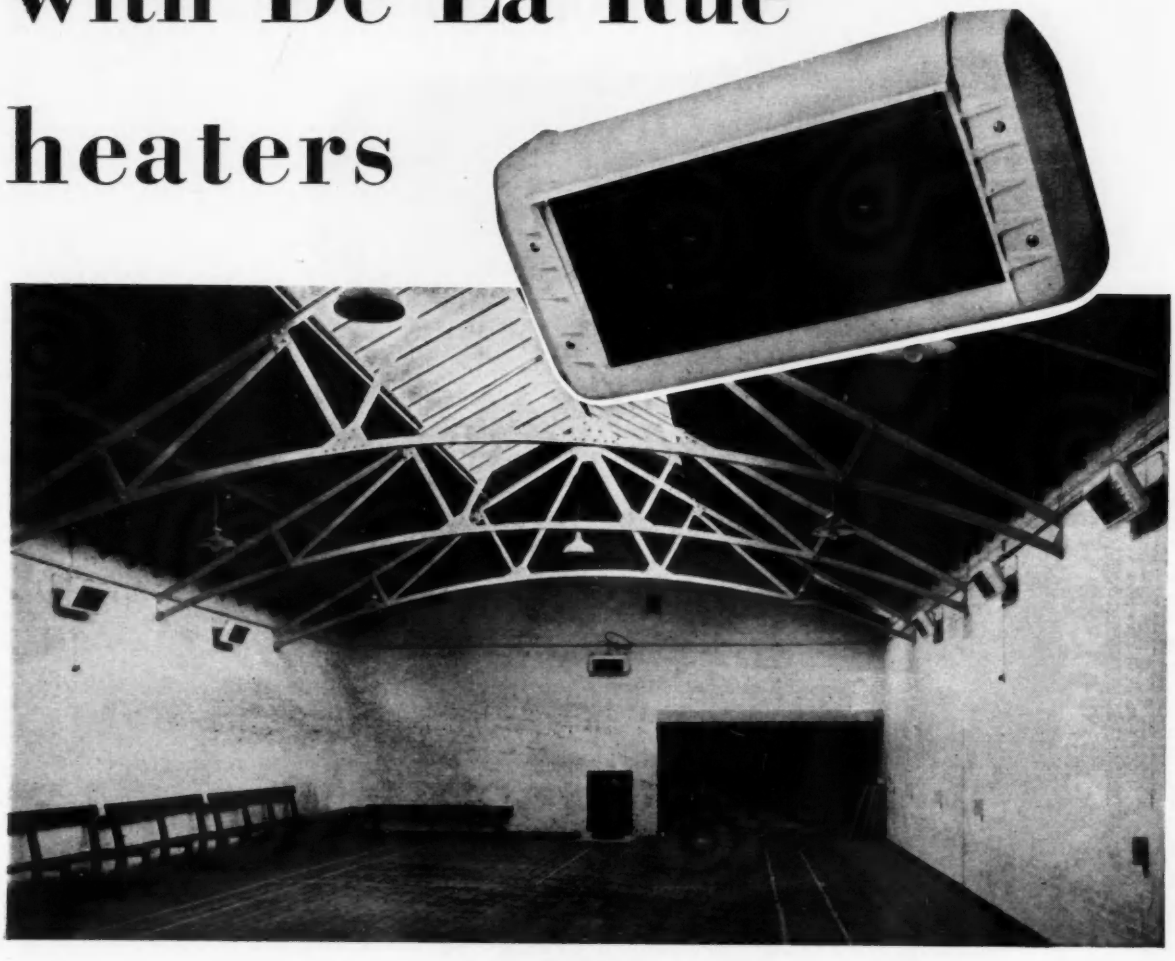
infra red

Cosiness has never been a notable feature of a military exercise, but a lecture or an evening 'at home' in the drill hall is quite a different matter. Warmth and comfort are very necessary. This was the problem confronting the men of the Territorial Army, Crewkerne, Somerset. Obviously some sort of heating had to be provided in their Drill Hall for wintry evenings. The installation was to be clean, and was not to take up any floor space. The system provided had to be sufficiently flexible to be operated economically for only a few hours, three or four evenings a week, and to be unaffected by the high heat losses inherent in this type of building.

The South Western Gas Board came to the rescue. They recommended, and later installed, eight stylised De La Rue *Gas-fired* infra red heaters. Now the Drill Hall's all Sir Garnett!

These panels are at work, with similar success, in many varied installations—in stores, offices, cinemas and schools, for example. They are easy to fix and require very little maintenance. Each unit is complete in itself, being supplied with lever cock and chain control, permanent pilot and gas

with De La Rue heaters



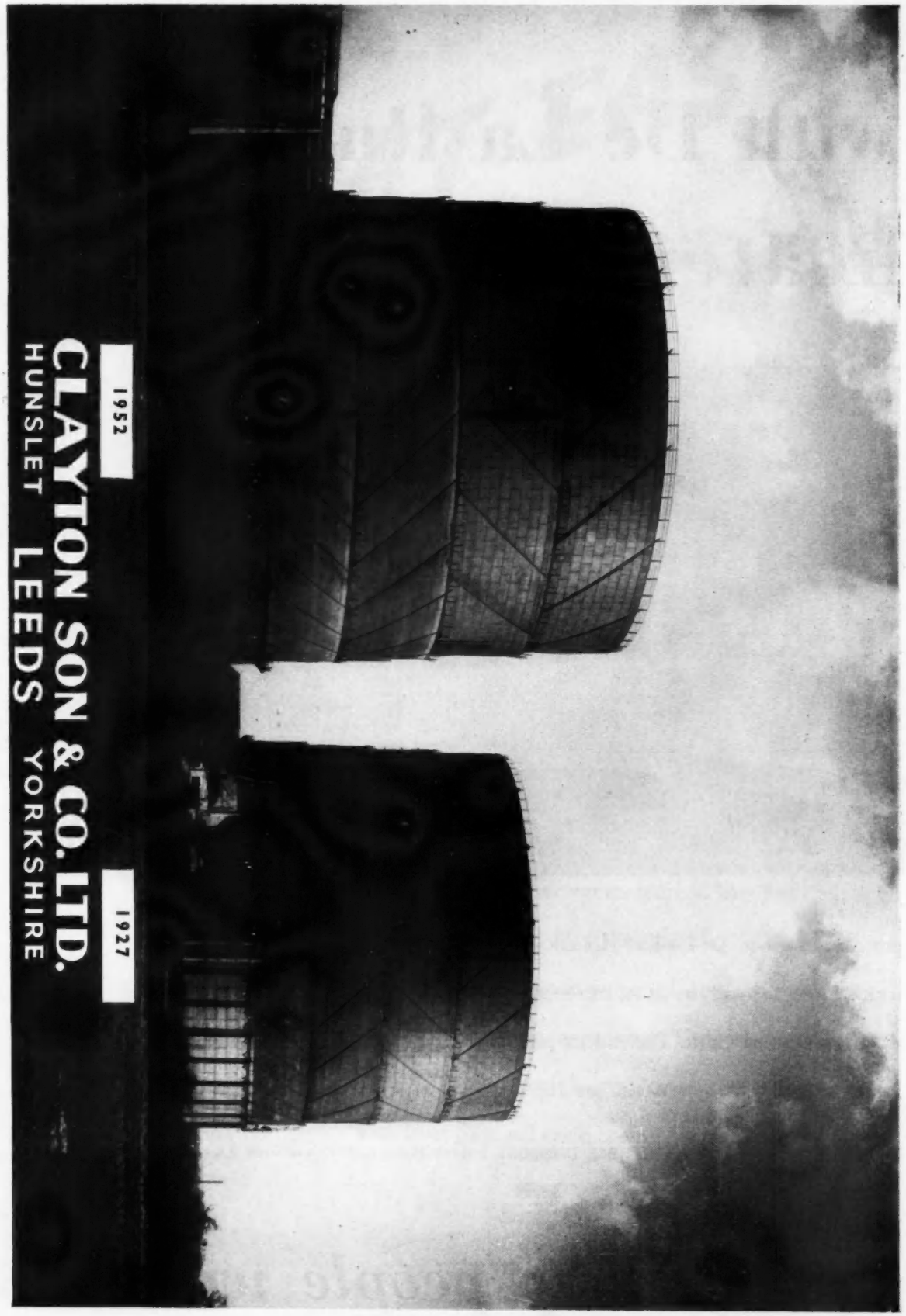
pressure governor. De La Rue Heaters are attractively styled to harmonize with all interiors and the panel surrounds are vitreous enamelled in Silver-Grey, Buff or Green mottled finish. The emitter plate is black enamel.

Industrial and safety-type models are also available; write for full details to:

THOMAS DE LA RUE & CO. LTD., (GAS DIVISION), Imperial House, 84/86 Regent Street, London W.1.

DE LA RUE INFRA RED SPACE HEATERS

keep people warm


1952
CLAYTON SON & CO. LTD.
HUNSLET LEEDS YORKSHIRE
1927

Refractory Concrete

The *Adaptable* Refractory Material

For many industrial processes where refractories are used, the advantages of Refractory Concrete have proved invaluable. Refractory Concrete is made from, and utilises the unique properties of, Ciment Fondu Aluminous cement and crushed firebrick or grog.

Its advantages are:

Ready for use and of great strength and hardness in 24 hours.
Can be used to reduce joints to a minimum.
Can be cast to any shape. Requires no pre-firing.
Is stable under load up to 1300°C.
Has a melting point of about 1450°C.
Has no appreciable drying shrinkage or after-contraction.
Can be brought to working temperatures 24 hours after making.
Does not spall under widest sudden fluctuations of temperature.
Pre-cast blocks or special shapes can be made of practically any size or shape without distortion or cracking.
Uses old scrap firebrick to a very large extent.
Provides an ideal bond for setting firebricks.
Can be used as a foundation for furnace structures or for linings.

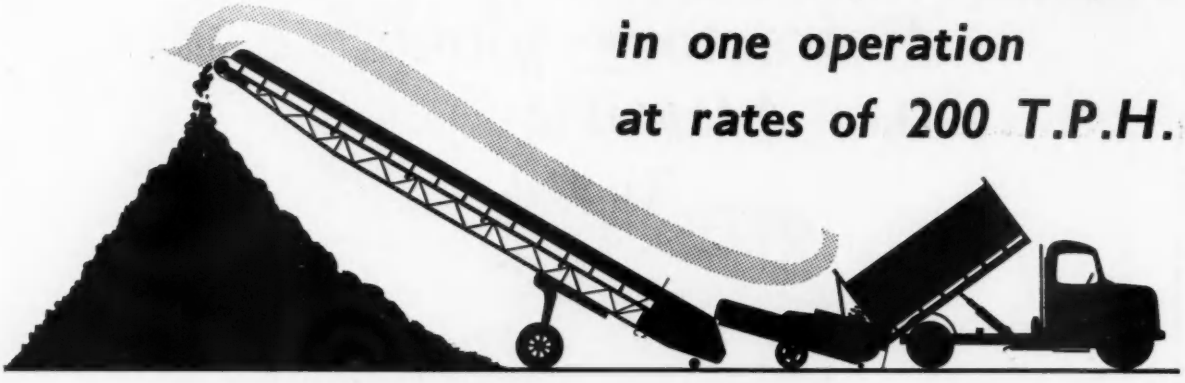
CIMENT FONDU
Regd. Trade Mark
ALUMINOUS CEMENT

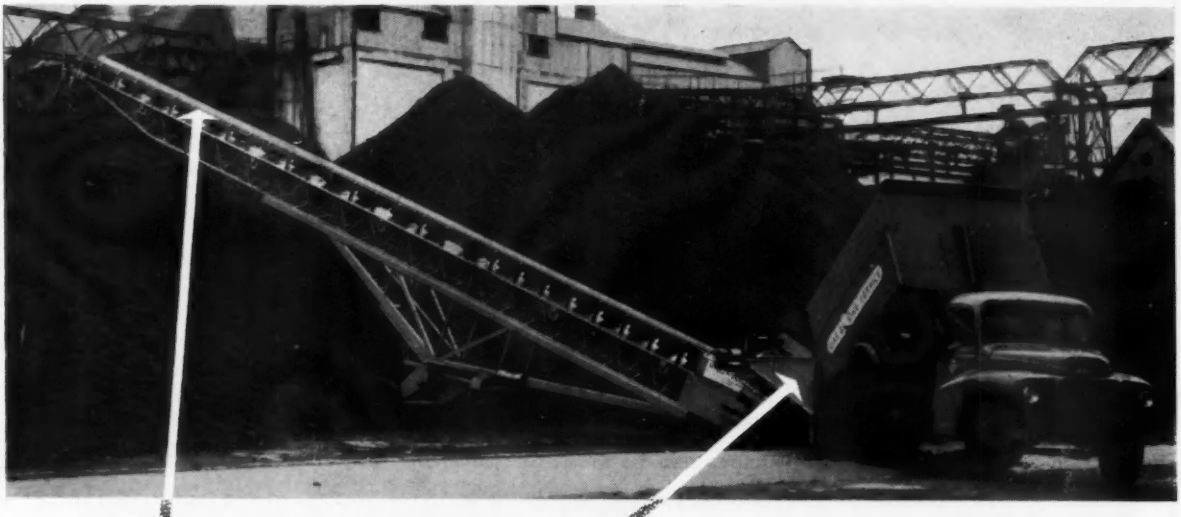
If these properties interest you, further details can be obtained by sending for literature.

LAFARGE ALUMINOUS CEMENT COMPANY LIMITED
73, BROOK STREET, LONDON, W.1.
Telephone: MAYfair 8546

3/1245

From lorry to stockpile in one operation at rates of 200 T.P.H.





JOHNSON HYLO-VEYOR

JOHNSON LOBAND LOADER

The Johnson "Hylo-Veyor" and "Loband" form an unbeatable combination for one-stage stockpiling. End-tipping lorries back straight up to it, discharging their loads directly into its large hopper. Totally eliminating the need for a ramp, the "Loband" also controls the rate of flow to the conveyor. The "Hylo-Veyor" embodies a retractable axle allowing two-thirds boom overhang forward of the wheels, and prevents "bogging in", even with low angle of repose stockpiling. Mobility is improved by the "Hylo-Veyor" lower overall weight and variation of discharge height is facilitated by hydraulic operation.

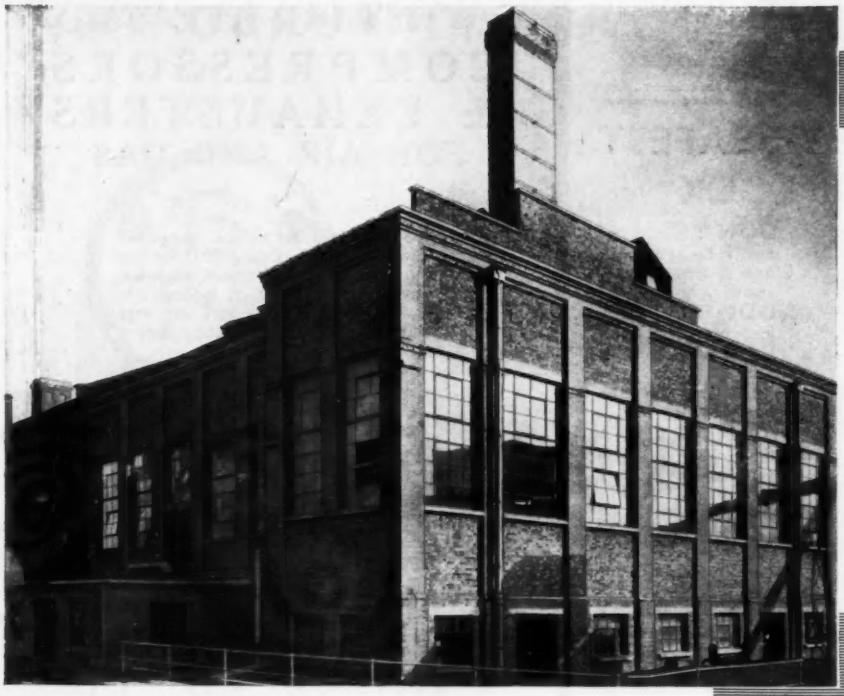
Fully illustrated literature GJ6738 available on request.

C. H. JOHNSON (MACHINERY) LTD.
ADSWOOD · STOCKPORT

Telephone: Stockport 2642/5. Telegrams: 'Machinery' Stockport.

LONDON TEL: Prospect 7671. GLASGOW TEL: Kilmacolm 558.

Est. 1790



Serving the Gas Industry

GIBBONS BROTHERS LIMITED

Contractors for :-

CARBONISING PLANT

CHARGING MACHINES

COAL AND COKE HANDLING PLANT

COKE OVENS

DRESSLER TUNNEL KILNS

FURNACES AND HANDLING PLANT

GAS PRODUCERS

GAS WORKS PLANT

GIBBONS (Dudley) LIMITED.

Manufacturers of :—

- Complete range of refractory goods for gas retort settings and coke ovens in fireclay, silica and siliceous qualities.

GIBBONS

DIBDALE WORKS, DUDLEY, WORCESTERSHIRE: Telephone : DUDLEY 3141.

M & M PATENT METER LOCKS

use the STRONGEST, SAFEST METER LOCK

- DON'T buy locks you may have to scrap in a few years
- DON'T look only at the initial cost
- DON'T think only of the present time; look to the future
- DO remember that good quality is cheapest in the long run
- DO take our word for it that our workmanship is consistently good
- DO profit by others' experience and use M. & M. Locks to protect your meters

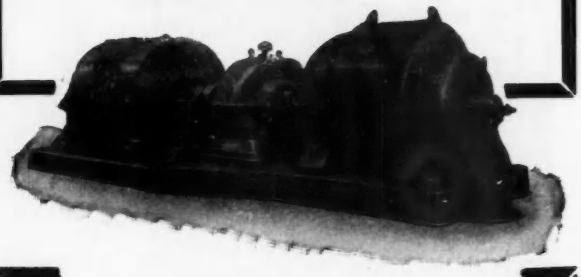
H. MITCHELL & CO.

36, 38, NEW CHARLES STREET, LONDON, E.C.1

TURBO-COMPRESSORS & EXHAUSTERS FOR AIR AND GAS

★ ★ ★

We build a complete range of Compressors & Exhausters for air and GAS, suitable for all purposes connected with the GAS industry, including Turbo-Compressors for large capacities, as illustrated below



WRITE FOR PAMPHLET No. 1018 GIVING PARTICULARS—

REAVELL & CO., LTD.,

RANELAGH WORKS, IPSWICH.

Telegrams: REAVELL, IPSWICH Telephone: 2124 & 5.

SILLIMANITE
BAUXITE

AND OTHER HIGH ALUMINA PRODUCTS

INSULATING FIREBRICKS

THREE GRADES FOR USE ON EITHER HOT FACE OR BACKING

WILLIAMSON, CLIFF LTD.
STAMFORD

RETORTS

FIRECLAY AND SILICEOUS WHOLEPIECE AND SEGMENTAL TO GAS ENGINEERS' SPECIFICATION

PATCHING CEMENT

TELEPHONES:
STAMFORD 3316
VICTORIA 5351

FIREBRICKS
SPECIAL SHAPES
36% TO 42% ALUMINA

FIRECLAY BLOCKS

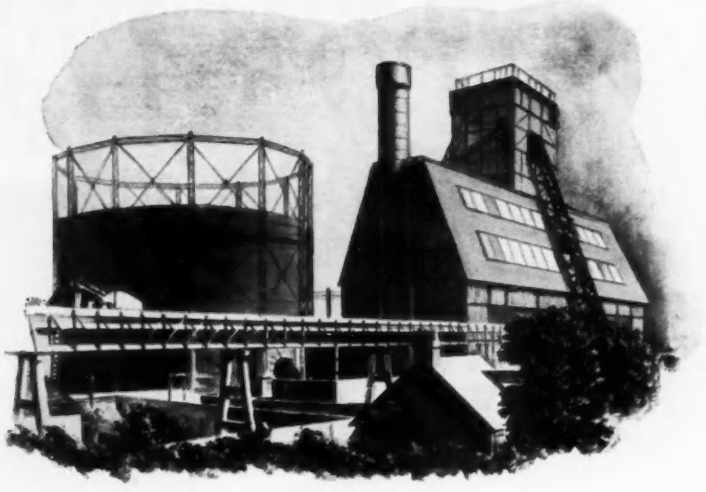
JOINTING CEMENT

Wheels of industry the world over are turned

by

B T-H

ELECTRIC MOTORS



in the gas works

Whenever a power drive is needed, there is a BTH motor that will do the job efficiently and economically. In industries all over the world, BTH motors are helping to increase production. Over half-a-century's experience of this branch of electrical engineering enables BTH to offer the motor with the mounting, enclosure, rating and performance best suited to the application.

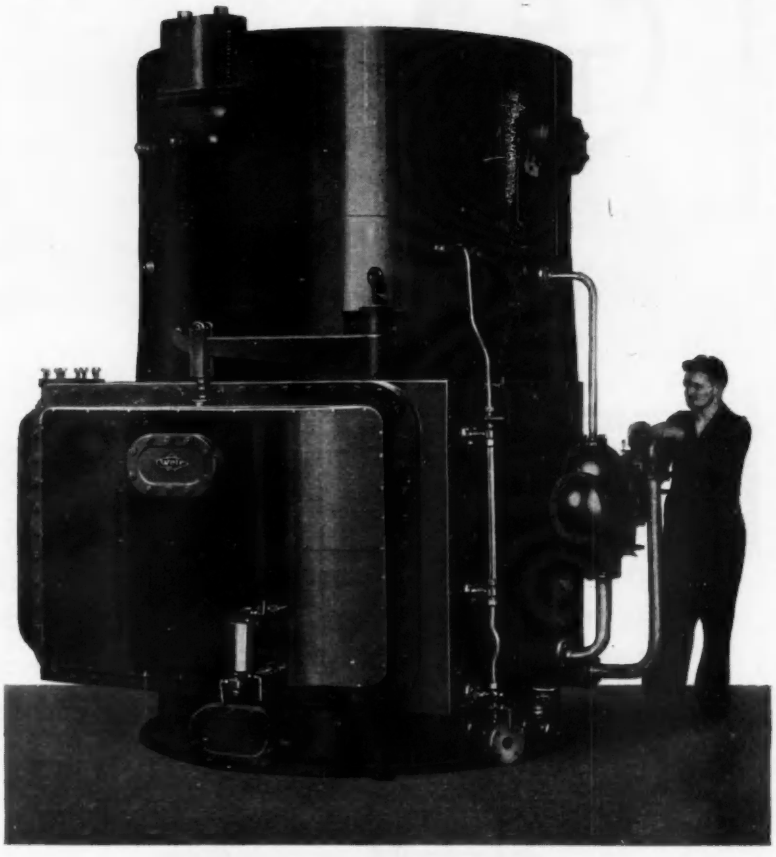
The BTH factories are exceptionally well equipped for making both ***STANDARD*** *and* ***SPECIAL*** *machines in large quantities.*

Member of the AEI group of companies

THE
BRITISH THOMSON-HOUSTON
COMPANY LIMITED, RUGBY, ENGLAND

A4735

WEIR *EVAPORATORS*



Weir Evaporators are made in single or multi-stage, horizontal or vertical designs for high or low pressure.

High pressure boilers demand pure feed make-up as an absolute necessity. Apart from the prevention of tube failures, high boiler and turbine efficiencies can be maintained, fuel consumption minimised, blow-down heat loss obviated, and stoppages for cleaning rendered unnecessary.

Write for Publication No. GK. 151,
"Weir Evaporating and Distilling Plants."

FEED HEATERS · EVAPORATORS
AIR PUMPS · DE-AERATORS
FEED REGULATORS

G. & J. WEIR LTD.
CATHCART · GLASGOW

GENERAL GAS APPLIANCES LIMITED

ARE PROUD TO ANNOUNCE THEIR NEW COOKER!

The

Crusader

The Crusader—with 5 brand new features—campaigns to help women

- **Flat hotplate**—on which pans can be placed in any position without spilling or tipping.
- **Oven flue vented through front of splash-plate.** This prevents walls being heat marked, and warms plates in double shelf rack.
- **Burners enclosed in special tray** safe-guarding grill from splashes.
- **All hotplate parts lift off** for easy cleaning.
- **Recessed toe space** protects base from marking and scuffing.

Your customers may choose this handsome cooker in any of these fine vitreous enamel finishes. All white, all cream, eau-de-nil and cream, white and grey. They'll admire the Crusader's push-in type safety taps on the facia panel, the fingertip thermostat oven control and the fully equipped oven, finished in light grey enamel.

THE CRUSADER SELLS ITSELF!

Made by
GENERAL GAS APPLIANCES LIMITED
AUDENSHAW, MANCHESTER
Proprietors: Allied Ironfounders Ltd.

"WELL AND
TRULY LAID"

MAINLAYING

Over 30 years' sound experience.
Skilled and gas-minded workmen.
Thousands of miles of mains have
been laid by JEAVONS.

E · E · JEAVONS & CO · LTD

TIPTON · · · · STAFFS

'Phone: TIPTON 2161 (5 LINES) *'Grams: "PIPELINES" TIPTON*

INDEX TO 'JOURNAL' ADVERTISERS

A

PAGE

A.C.E. Machinery, Ltd. ... ...
Abbott, Birks & Co., Ltd. ... ...
Acme Wringers, Ltd. ... ...
Aerogen Co., Ltd. 17
Aerograph Co., Ltd. ... ...
Alder & Mackay, Ltd. ... ...
Aldridge & Ranken Ltd. ... ...
Alexander Controls, Ltd. ... ...
Allan Taylor (Engineers), Ltd. ... ...
Allen, John & Son (Oxford) Ltd. 18
Amal, Ltd. ... ...
Ascot Gas Water Heaters, Ltd. ... ... Cover IV
Ascot Gas Water Heaters, Ltd. (F. A. Neat) ...
Ashmore, Benson, Pease & Co. .. ..
Aspinall's (Paints), Ltd. ... ...
Associated Lead Manufacturers, Ltd. ... ...
Associated Lead Manufacturers, Ltd. (Rustodian)
Atlas Preservative Co., Ltd. ... ...
Audley Engineering Co., Ltd. 19
Autocontrol Boilers, Ltd. ... ...
Automatic Telephone & Electric Co., Ltd. ...
Automotive Products, Ltd. ... ...

B

Bale & Church, Ltd. 61
Balfour, Henry, & Co., Ltd. 16
Bayley, Thos. (Great Bridge) Ltd. 60
Begwaco Meters, Ltd. ... ...
Benham & Sons, Ltd. ... ...
Blakeley Firth, Sons & Co., Ltd. ... ...
Bolton's Superheater & Pipe Works Ltd. ...
Booth, John, & Sons (Bolton), Ltd. ... ...
Bratt Colbran, Ltd. ... ...
Bray, George, & Co., Ltd. ... ...
Bray, W. E., & Co., Ltd. ... ...
Bristols Instrument Co., Ltd. ... ...
British Flint & Cerium Manufacturers, Ltd. ...
British Gas Purifying Materials Co., ...
British Oxygen Co., Ltd. 3
British Paints, Ltd. ... ...
British Rototherm Co., Ltd. ... ...
British Thermostat Co., Ltd. ... ...
British Thomson Houston, Ltd. 27
British Vacuum Cleaner & Engineering Co., Ltd.
Broadbent, Thomas, & Sons, Ltd. 6
Brockhouse Heater Co., Ltd. ... ...
Broom & Wade, Ltd. ... ...
Brown, J., & Co., Ltd. 60
Bugden, Thos., & Co. 60

C

Cambridge Instrument Co., Ltd. .. ...
Cannon (G. A.), Ltd. ... ...
Cascade Water Coolers, Ltd. ... ...
Cathodic Corrosion Control, Ltd. ... ...
Cementation Co., Ltd. ... ...
Chaseside Engineering Co., Ltd. ... ...
Cinema-Television, Ltd. ... ...
Clapham Bros., Ltd. 10
Clayton, Son & Co., Ltd. 22
Clifford Engineering Co., Ltd. ... ...
Cochrane (Middlesbro') Foundry, Ltd. ... ...
Cohen, George, Sons & Co., Ltd. 7
Concrete Proofing Co., Ltd. ... ...
Consolidated Pneumatic Tool Co., Ltd. ... ...
Consett Iron Co., Ltd. ... ...
Crane, Ltd. ... ...
Crone & Taylor, Ltd. 15
Crosby & Co., Ltd. ... ...
Crossley Bros. ... ...
Crowley Russell, & Co., Ltd. 9
Curtis, A. L., & Co. ... ...
Cutler, Samuel, & Sons,'Ltd. 50

D

Davenport Engineering Co., Ltd. ... ...
Davey, Paxman & Co., Ltd. ... ...
De la Rue, Thomas, & Co., Ltd. (Gas Group) ...20, 21
Dempster, R. & J., Ltd. 1
Dempster, Robert, & Sons, Ltd. ... ... Cover I
Denison & Son, Ltd. ... ...
Derbyshire Silica Firebrick Co., Ltd. 8
Diaphragm & General Leather Co., Ltd. ...
Dick, R. & J., Ltd. 2
Donkin (The Bryan) Co., Ltd. ... ... Cover II
Douglas, Wm., & Sons, Ltd. ... ...
Drakes, Ltd. ... ...
Dresser Manufactures (England), Ltd. ... ...
Drew, H. B., Ltd. ... ...
Drummond Patents Ltd. ... ...
Dunlop & Ranken, Ltd. ... ...
Dunlop Rubber Co., Ltd. (Gen. Rubber Goods Division) ... ...

E

E.B. Refractory Cement Co., Ltd. ... ...
Edgar, William, & Son, Ltd. ... ...
Elcontrol, Ltd. 33
Electric Construction Co., Ltd. ... ...
Electroflo Meters Co., Ltd. ... ...
Electrolux, Ltd. ... ...
Elliott Bros. (London), Ltd. ... ...
Essard Ltd. ... ...
Ether, Ltd. ... ...
Ewart Chainbelt Co., Ltd. 60
Expanded Metal Co., Ltd. ... ...

F

F. C. Construction, Ltd. ... ...
Film Cooling Towers (1925) Ltd. ... ...
Fisher & Ludlow, Ltd. ... ...
Flavel, S., & Co., Ltd. 47
Fowler, John, & Co. (Leeds), Ltd. ... ...
Franki Compressed Pile Co., Ltd. ... ...
Franklin Furnace Co., Ltd. ... ...
Fry's Metal Foundries, Ltd. ... ...
Fyffe & Co., Ltd. ... ...

G

PAGE

Gas Purification & Chemical, Ltd. 61
General Descaling Co., Ltd. ... ...
General Electric Co., Ltd. ... ...
General Gas Appliances, Ltd. 29
Gibbons Bros., Ltd. 25
Glover, George, & Co., Ltd. ... ...
Glover, Thomas, & Co., Ltd. 34
Goodall Clayton & Co., Ltd. 60
Goodyear Mechanical Goods ... ...
Graphite Products, Ltd. ... ...
Green & Boulding, Ltd. 61

H

Hamilton, A. H., & Co., Ltd. ... ...
Hardman & Holden, Ltd. ... ...
Harris & Pearson, Ltd. 60
Harrisons (London), Ltd. 61
Harvey, G. A., & Co. (London), Ltd. ... ...
Hattersley & Davidson ... ...
Hick Hargreaves & Co., Ltd. ... ...
Hilmor, Ltd. ... ...
Hills (West Bromwich), Ltd. ... ...
Holman, Michell & Co., Ltd. ... ...
Holmes, W. C., & Co., Ltd. 63
Hopkinsons, Ltd. ... ...
Horseley Bridge & Thomas Piggott, Ltd. ...
Horstmann Gear Co., Ltd. ... ...
Howden, James, & Co., Ltd. ... ...
Humphreys & Glasgow, Ltd. 32

I

Ideal Boilers & Radiators, Ltd. ... ...
I.C.I., Ltd. (Metals Division) ... ...
Ingham, John, & Sons, Ltd. ... ...

J

Jeavons, E. E., & Co., Ltd. 30
Jeavons Engineering Co. ... ...
Jenkins, W. J., & Co., Ltd. ... ...
Jobling, James A., & Co., Ltd. ... ...
Johnson, C. H., (Machinery), Ltd. 24

K

Keay, E. C & J., Ltd. 2
Keith Blackman, Ltd. 64
Kent, Geo., Ltd. ... ...
Kings Patent Agency, Ltd. ... ...
King, Walter, Ltd. 60
Kirk & Co. (Tubes), Ltd. ... ...
Kirkham Hulett & Chandler, Ltd. 14

L

LaFarge Aluminous Cement Co., Ltd. 23
Laidlaw, R., & Son (Edin.), Ltd. ... ...
Lamont, James H., & Co., Ltd. ... ...
Lanarkshire Bolt & Rivet Co., Ltd. ... ...
Lancashire Dynamo & Crypto, Ltd. 11
Le Bas Tube Co., Ltd. ... ...
Leeds Fireclay Co., Ltd. ... ...
Lionweld, Ltd. ... ...
Lind, Peter, Ltd. ... ...

M

Macpherson, Donald, & Co. Ltd. ... ...
Magnetic Valve Co., Ltd. ... ...
Main, R. & A., Ltd. ... ... Facing p. 41
Measurements, Ltd. ... ...
Meltham Silica Fire Brick Co., Ltd. ... ...
Meters, Ltd. ... ...
Metropolitan Leather Co., Ltd. ... ...
Metropolitan Vickers Electrical Co., Ltd. ...
Milnes Meters, Ltd. ... ...
Mint, Birmingham, Ltd. ... ...
Mitcham Smelters, Ltd. 62
Mitchell Engineering, Ltd. ... ...
Mitchell, H., & Co. 26
Moler Products, Ltd. ... ...
Monitor Engineering & Oil Appliances, Ltd. ...
Monk, A., & Co., Ltd. ... ...
Mucklow Bros., Ltd. .. ..

N

National Benzole Co., Ltd. ... ...
National Enamels, Ltd. ... ...
New Conveyor Co., Ltd. ... ...
Newton Chambers & Co., Ltd. ... ...
Norwest Construction Co., Ltd. ... ...
Nu-Swift, Ltd. ... ...

O

Oxley Engineering Co., Ltd. ... ...

P

Parkinson & Cowan (Gas Meters), Ltd. 34
Parkinson & Cowan Group ... ...
Parkinson Stove Co., Ltd. ... ...
Pass, E., & Co., Ltd. ... ...
Peckett & Sons, Ltd. ... ...
Peebles & Co., Ltd. ... ...
Perl Controls, Ltd. ... ...
Plenty & Son, Ltd. ... ...
Power-Gas Corporation, Ltd. ... ...
Pratt Engineering Co ... ...
Press, William, & Son, Ltd. ... ...
Pulsometer Engineering Co., Ltd. ... ...

R

PAGE

Radiant Heating, Ltd. ... ...
Radiation, Ltd. 48, 49
Rawlplug Co., Ltd. ... ...
Reavell & Co., Ltd. 26
Remington Rand, Ltd. ... ...
Richmond Welding Co. ... ...
Ride & Bell, Ltd. ... ...
Riley, A. J., & Son, Ltd. 4
Roberts, R. E., & Sons, Ltd. ... ...
Robinson, J. H., & Co. (Liverpool), Ltd. ...
Rook Bros., Ltd. 61
Royston, Geo., & Sons, Ltd. ... ...
Russell Bros. (Walsall), Ltd. ... ...
Russell, R., & Sons, Ltd. ... ...

S

Salter, T. E., Ltd. ... ...
Senior Economisers, Ltd. ... ...
Shaw & McInnes Ltd. ... ...
Shelton Iron, Steel & Coal Co., Ltd. ... ...
Siebe Gorman & Co., Ltd. ... ...
Siemens-Schuckert (Great Britain), Ltd. ...
Sigma Instrument Co., Ltd. ... ...
Simon-Carves, Ltd. ... ...
Simon, Richard, & Sons, Ltd. ... ...
Sisson, W., & Co., Ltd. ... ...
Smith Meters, Ltd. ... ...
Smith, Thos., & Sons (Rodley), Ltd. ... ...
Speedwell Gear Case Co., Ltd. ... ...
Spencer Bonecourt, Ltd. 17
Sperryn & Co., Ltd. ... ...
Stanton Ironworks Co., Ltd. ... ...
Staveley Iron & Chemical Co., Ltd. ... ...
Steels Eng. Products, Ltd. ... ...
Stein, John G., & Co., Ltd. ... ...
Stelcon (Industrial Floors) Ltd. ... ...
Stewart & Gray, Ltd. ... ...
Stewarts & Lloyds, Ltd. ... ...
Stoves, Ltd. 5
Strachan & Henshaw, Ltd. ... ...
Stringer Bros. ... ...
Sugg, Wm., & Co., Ltd. ... ...
Summerson, Thos., & Sons, Ltd. ... ...
Sutcliffe Speakman & Co., Ltd. ... ...
Sutherland, A. G., Ltd. ... ...

T

T & T Works, Ltd. ... ...
Tangyes, Ltd. ... ...
Thermal Syndicate, Ltd. ... ...
Thomas & Bishop, Ltd. ... ...
Thompson, John, Conveyor Co. ... ...
Thorp, Thomas, & Co., Ltd. ... ...
Tucker, Eyelet, Geo., Co., Ltd. ... ...
Tully Engineering Co., Ltd. ... ...
Turners Asbestos Cement Co., Ltd. ... ...

U

Underpressure Engineering Co., Ltd. 60
United Kingdom Construction & Engineering Co., Ltd. ... ...

V

Victaulic Co., Ltd. ... ...
Visco Engineering Co., Ltd. ... ...
Vulcan Stove Co., Ltd. 6

W

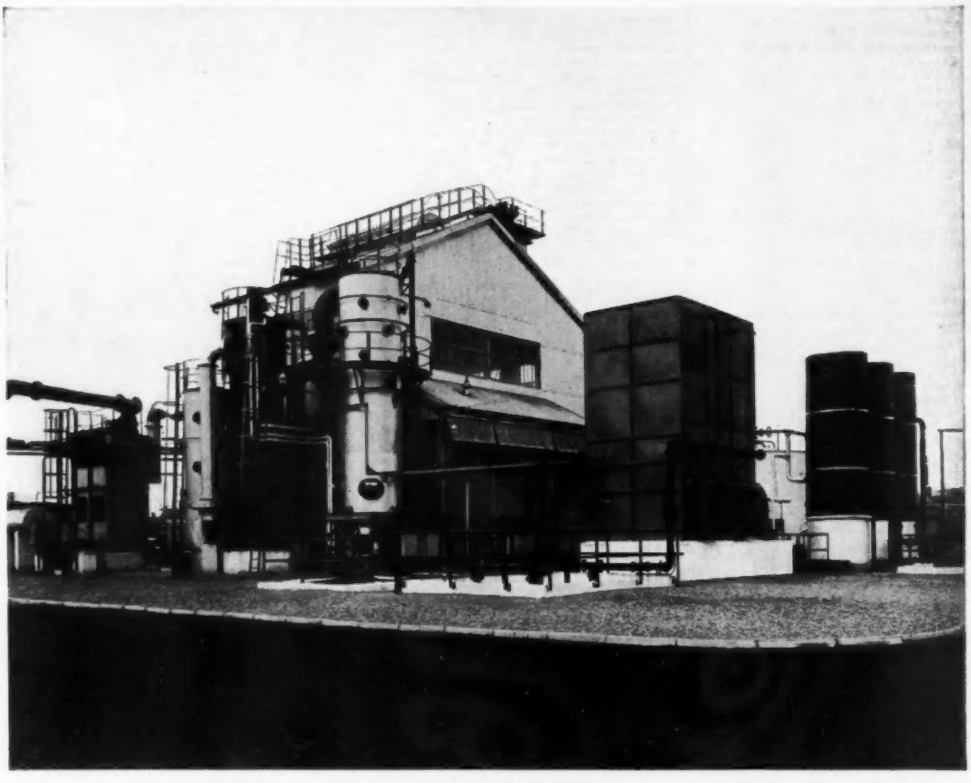
Wakelin, F. H., Ltd. ... ...
Walker, C. & W., Ltd. 50
Walker, Crosweller & Co., Ltd. ... ...
Walker, Wm., & Sons (Hanley), Ltd. ... ...
Waller, George, & Sons, Ltd. ... ...
Ward, Thos. W., Ltd. ... ...
Weir, G. & J., Ltd. 28
Wellington Tube Works, Ltd. ... ...
Wellman Smith Owen Engineering Corpn., Ltd.
West's Gas Improvement Co., Ltd. ... Cover III
West's Gas Improvement Co., Ltd. (C.O.L.) Division) ... ...
West Hunwick Silica & Firebrick Co., Ltd. ...
West's Piling & Construction Co. ... ...
Westwood & Wrights, Ltd. ... ...
Whessoe, Ltd. 13
Whitlock Bros., Ltd. ... ...
Whittaker Ellis, Ltd. ... ...
Whittaker Hall & Co. (1929), Ltd. 18
Wilkes, A. H., & Co., Ltd. ... ...
Willey & Co., Ltd. ... ...
Williams, John E., Ltd. ... ...
Williamson Cliff, Ltd. 26
Wilson, George, Gas Meters, Ltd. ... ...
Winn & Coales, Ltd. ... ...
Woodall-Duckham Construction Co., Ltd. facing p. 40
Wood, Hugh, & Co., Ltd. 12
Wormald Patent Locks Co., Ltd. ... ...

Y

Yorkshire Copper Works, Ltd. ... ...

Agency ... ...
Appointments Vacant 61, 62
Appointment Wanted ... ...
Contracts Open ... ...
Educational ... ...
Miscellaneous 61
Patents ... ...
Plant, For Sale 62
Publications ... ...
Repair Work... ... ...

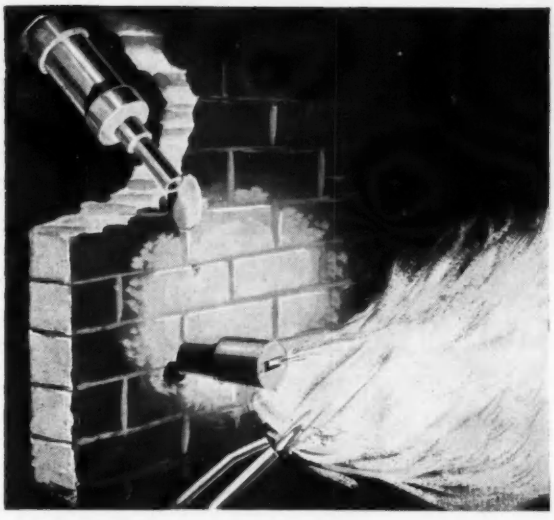
CATALYTIC OIL GAS PLANT
ONIA-GEGI PROCESS



Installation at the Stafford Works of the West Midlands Gas Board.

The Humphreys-Glasgow Catalytic Oil Gas Plant utilising the ONIA-GEGI Process produces Town Gas of normal quality from Heavy Oil, Natural Gas or Refinery Gas.

HUMPHREYS & GLASGOW LTD
HUMGLAS HOUSE · CARLISLE PLACE · LONDON · S.W.1
Telephone: VICtoria 3961
ESTABLISHED 1892



SAFE LIGHTING UP WITH FSM

The new principle of the Elcontrol FSM Flame Failure Equipment is the detection of fluctuating infra-red radiation which is characteristic of every flame.

a FSM Equipment is equally effective on any gas.

b It gives positive discrimination between flame and glowing refractory.

c It does away with difficulties connected with correct siting, excess dust in flame, or probe leakage often encountered with flame conductivity systems.

d Permissible cable run from viewing head to unit up to 100 ft.

e Fully automatic ignition and flame failure control panels are now available, as well as basic on-off control units from under £30.

Send for FSM Data Sheets:

TRADE E MARK

ELCONTROL LTD

10 Wyndham Place, London, W.1

Ambassador 2671

c

Gas Journal

VOL. 281 NO. 4779 JANUARY 5, 1955

107TH YEAR

MANAGING DIRECTOR: Clifford A. King

EDITOR: Trevor G. Williams, A.M.I.Mech.E., Assoc.Inst.Gas E., M.Inst.F.

DEPUTY EDITOR: Arthur C. Cross

Published by Walter King Limited, 11, Bolt Court, Fleet St., London, E.C.4

Telephone: Central 2236-7. Telegrams: Gasking, Fleet.

CONTENTS

EDITORIAL COMMENT

Why Tax Efficiency ? .. 35
Sulphate of Ammonia .. 36
1955 Calendar and Directory .. 36

TECHNICAL RECORD

Human Relations in Industry. By Kenneth E. Stringer and Kenneth P. Duncan .. 39
Instrumentation in the Gas Industry. By T. A. Lucas .. 43
Repairing a Bench of Continuous Vertical Retorts. By H. Kettlewell .. 51

CORRESPONDENCE

Cheque Endorsement. J. R. W. Alexander .. 38

NEWS OF CURRENT EVENTS

Personal .. 37
Obituary .. 38
Gallantry Rewarded .. 53
Growing Output of Sulphate of Ammonia .. 54
North Eastern Coke Officers .. 55
Oxford Street Store Warming .. 55
Cork Gas Workers' Pay .. 57
Scottish Juniors' Joint Meeting .. 57
New Showrooms for Oldbury .. 57
City and Guilds Prize Awards .. 57
Summer Warmth in Winter .. 58
Mains Entertain Central Sales Circle .. 58
Calendars and Diaries .. 59
Festive Season Window Displays .. 59
The 'Bamburgh' .. 59
Diary .. 59

GAS CONSULTATIVE COUNCILS

Northern: Margins on Standard Cookers; North Western: £1 Mill. Gas Surplus .. 56

PUBLISHERS' NOTICE, SEE DECEMBER 29, 1954

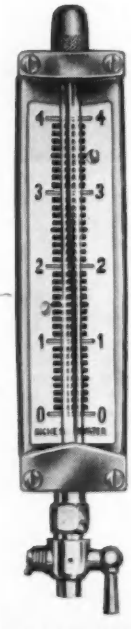
the new A·1

steel casing with soldered seam • die-cast chamber ensures mechanical accuracy • new method of securing diaphragms prevents puckering in fitting • diaphragms assembled in pairs as units — easy to release and replace • measuring unit can be removed from casing without dismantling index.

THOMAS GLOVER & CO. LTD.

GOTHIC WORKS, ANGEL ROAD, EDMONTON, LONDON, and BRANCHES

TG5



A New Design

4" Water Gauge

This addition to our wide range of single tube and double limbed pressure gauges is made with a die-cast body, and is ideal for governed pressure industrial appliances.

PARKINSON AND COWAN INDUSTRIAL PRODUCTS

(A DIVISION OF PARKINSON & COWAN LTD)

DEPT. Q COTTAGE LANE, CITY ROAD, LONDON EC1 Tel: CLErkenwell 1766/7

PG1

Gas Journal

VOLUME 281. No. 4779. JANUARY 5, 1955. 107th YEAR

Why Tax Efficiency?

THE story of the purchase tax on gas water heaters is one of the most fantastic of modern times. The curve representing the ups and downs of this levy on gas water heaters is an exaggeration of the temperature chart of a patient whose disease cannot be diagnosed by the most qualified and practised doctors. But there the analogy ends. The case history of the gas water heater has been diagnosed by qualified technicians and defined by competent analysts. On the other hand this same case history, ever since the imposition of purchase tax, has been pathologically hysterical. The sudden rises and falls in this particular levy were calculated to beggar and bewilder the most astute and learned accountant, while the effect of the rises and falls was to disorganise a skilled trade and to cause severe hardship among the craftsmen who were engaged in it. There was no logic underlying these whimsical yet alarming changes in mood.

The Beaver Report speaks of air pollution costing the nation more than £300 mill. per year. In comparison with this, the amount the Exchequer extracts from the gas water heater tax is negligible. But that is by no means all. While the tax is being collected, the nation is being exhorted to save coal; and it is to be noted that the Chairman of the National Coal Board has only recently expressed a depressingly gloomy view on the quantity of coal which is being mined today. The importance of coal conservation has in no way diminished. Reports come and reports go to the shelf; discussion continues unabated and all too often spells inaction. For a moment let us go back to 1952. In September of that year, the Ridley Committee reported that for intermittent water heating the needs of the average family could be met more economically, in terms of coal, by the use of gas or electricity than of solid fuel, and it added that electricity consumes more coal for a summer hot water service than does gas. A vicious 'smog' descended three months after the Ridley Report and this terrible experience led to the setting up of the Beaver Committee, whose findings we have discussed previously. Gas water heating assists not only smokelessness, but conservation of coal. The gas water heater is not a luxury. It should be regarded as a means of national economy in two directions at least—those of smokelessness and conservation of coal. It is essentially a tool of national economy even in the narrow and direct financial sense. Why then limit the use of this instrument of economy by penalising it at the outset by imposing such a high purchase tax?

We have already commented on the implications of the Beaver Report on coke production and marketing. The programme envisaged means that we must sell to the best advantage to industry and the community the much greater volume of gas which will be available. The recommendations of the Beaver Committee constitute a challenge to the gas industry to expand both its smokeless fuel markets. We feel that the challenge cannot be met with any sort of satisfaction in the absence of a really forceful and sustained drive in the field of gas water heating.

There are designs of gas water heater, both storage and instantaneous, of proved efficiency. A vast market is there if the gas industry wants it and is prepared to work for it. As far as instantaneous gas water heaters are concerned the story of the industry's activities is not particularly inspiring. The truth is that the suppliers of gas pretty well left it to the manufacturers of appliances to develop the load and to organize an adequate maintenance service. What we should like to see is an enthusiastic co-operative water heater sales campaign on a much grander scale than hitherto. The present set-up of the industry is such as to enable a full-blooded plan to be put into practice.

In saying this we are not unmindful of what has been done or is, maybe, in the offing. A glance at the results of the working of the area boards during the last financial year shows what opportunities lie at the door of salesmanship. The South Western Gas Board has demonstrated admirable awareness and liveliness. In the period, when hire purchase restrictions were alleviated, the number of water heaters sold was twice that of the previous year. In addition, the introduction by the Board of simple hire terms in the July of 1953 met with an immediate and excellent response. In the area of the Southern Board, sales of water heaters increased by 100%. These are examples. But in the general run of the area board reports there is insufficient emphasis on the possibilities of the gas water heating load and of the steps which are being taken to translate these possibilities into practice in the national interest.

There is before us the vista of purchase-tax abolition on gas water heaters. Is it too much to ask the supply side of the industry to decide on a long-term policy and to take the appliance manufacturers fully into its confidence, explaining freely and frankly the targets and the

means to them? Gas space heating equipment has not suffered from the same vagaries, but its rightful development has been pinioned by purchase tax. There can be no question but that it would be in the interest of the better use of fuel if the gas industry was to increase the amount of coal it carbonizes annually to double the present quantity. Thereby, the recommendations of the Ridley Committee and the Beaver Committee would be implemented. We should have a cleaner atmosphere and we should save coal. Simply stated, there is no scientific or financial case for the levy of purchase tax on gas water heating and space heating appliances.

Sulphate of Ammonia

IN common with other coal carbonizing interests the gas industry continues to make a useful contribution to agriculture in the form of sulphate of ammonia and ammoniacal liquor, both of which have been proved by ripe experience to rank high among fertilizers. The Gas Council in its recent review of the first five years since vesting date recorded that the demand for sulphate of ammonia had been well maintained, and the payment of a subsidy on its use as a fertilizer had given encouragement to this market. For the year ended last March the gas industry's sales of sulphate of ammonia at 82,700 tons were greater by 1,600 tons than in the year 1952-53, and an increased quantity of ammoniacal liquor was sold for direct application to the land. Results of experiments carried out by the Edinburgh and East of Scotland College of Agriculture to ascertain the qualities of the liquor as a direct fertilizer under Scottish conditions were encouraging, and arrangements were made for more extensive trials on farms at Armadale, Haddington, Hawick, and Peebles.

The annual report of the British Sulphate of Ammonia Federation, which we summarize on p. 54 records that the upward trend in world nitrogen production and consumption continued in the year ended last June. Compared with the previous year, total production rose by about 11% and total consumption by 13.2%. The increase for agricultural use was 11.5% and for industrial use nearly 22.2%. Home output of fertilizer products increased by 3.6% and production for industrial use by 11.9%. Total shipments of sulphate of ammonia from the United Kingdom last year amounted to 299,000 tons, which was 34% less than in the previous year, when exceptionally large shipments were made.

Dealing with manufacturing research the report mentions that four works with a total annual output of 12,000 tons were registered as Grade 1 producers during the year, bringing the number to 37, representing 40% of the by-product make. Although general agreement has been reached with collaborating members on the development of suitable methods for the determination of impurities in coke oven liquors a few details are still under discussion and it has not yet been possible to publish the methods in the summary of reports. Mr. Michael Milne-Watson continues to share with Mr. Lawrence Weaver the duties of Vice-Chairman of the Federation, and seven of the 12 area gas boards are directly represented on the Council and its Executive and Finance Committees.

1955 Calendar and Directory

HOW often during the course of a year do we hear the question—'I wonder who is station engineer at such and such a works?' or 'Where can I get hold of so-and-so statistics?' or 'Who is in the market these days for this or that piece of plant?' These and many other questions like them arise every day in all parts of the gas industry and it may not be generally realised that there is an annual publication which is designed specifically to answer them all. This is the GAS JOURNAL Calendar and Directory, often known affectionately and more simply as the 'C and D'. The 1955 edition of this stalwart friend of the gas engineer has just been published by Walter King, Ltd., at 25s., post free, and as usual it contains a wealth of valuable information concerning all aspects of the gas industry.

This book is divided into three main sections which are clearly marked by means of projecting tabs. These are a new feature, and they certainly make it very easy to find the section required at once. The first section comprises the Directory, which gives details of the nationalised gas industry in Britain, gas undertakings in the Commonwealth and overseas, the Institution of Gas Engineers, gas associations in the United Kingdom, national organizations intimately connected with gas and organizations having kindred interests. Under these headings are given particulars of all the chief personnel of the industry and of its associated bodies, together with many useful statistics relating to the outputs of the various works, the calorific values of gas distributed, the types of plant installed, the number of consumers in the areas, the price of gas, etc. Altogether there are 168 pages in the Directory Section and in them it is possible to find the answer to practically any question of identity concerning the people that are running the gas industry today.

Following the Directory is the Handbook Section in which 94 pages are devoted to concise technical information and data relating to gas manufacture and distribution. Such subjects as benzole recovery, calorimetry, coke, distribution, exhausters, gasholders, purification, refractories, works tests, to mention but a few, are fully dealt with in the light of the latest knowledge. An idea of the 'up-to-dateness' of the information given may be gained from the fact that notes are included on the Rochdale process, on the various processes in use or under development for the complete gasification of coal, for the production of oil gas for peak load purposes and for the use of butane-air in country districts.

The third section of this valuable reference book, 263 pages, is devoted entirely to the interests of buyers and advertisers. Practically every major supplier of plant, equipment or appliances in any way connected with the manufacture, distribution, or utilization of gas and coke is represented in the Buyers' Guide, the Directory of Advertisers and in the advertisements themselves.

Considering the wide variety of information contained in the Calendar and Directory, the orderliness with which the information is arranged and also the ease with which any desired reference can be turned up, it would not be too much to say that this is a 'must' for every gas engineer's bookshelf or desk. Preferably it should be kept near at hand where it can be reached at a moment's notice.

Distribution of the 'GAS JOURNAL' Calendar and Directory is now well advanced and all subscribers should have their copies within a short time. In the meantime, a corrigenda slip has been distributed covering changes made since publication and before December 20. The following alterations have been made since that date:—

Page D27.—EAST MIDLANDS GAS BOARD: Add J. F. Morrissey, J.P., *Part-time Member.*

Page D51.—NORTH THAMES GAS BOARD: Add Sir Clifford Radcliffe, C.B.E., *Part-time Member.*

Personal Notes

NEW YEAR HONOURS

The New Year Honours published on Saturday included a Barony for DR. EDGAR DOUGLAS ADRIAN, O.M., President of the Royal Society, President of the British Association, and Master of Trinity College, Cambridge, who was one of the principal guests and proposed the toast of the Institution at the President's luncheon of the Institution of Gas Engineers in London in May, 1952. Another Barony of indirect interest to the gas industry was that conferred on SIR WILLIAM FRASER, C.B.E., Chairman of the Anglo-Iranian Oil Company (now the British Petroleum Company).

MR. GEORGE FREDERICK HAMER, C.B.E., Chairman of the Wales Gas Consultative Council and a part-time member of the Wales Gas Board, received a Knighthood in recognition of public services in Wales. He is Lord Lieutenant of Montgomeryshire.

MR. JOHN TATTERSALL HAYNES, General Manager of the Western Division of the Southern Gas Board, and Immediate Past-President of the Institution of Gas Engineers, received the O.B.E.

MR. THOMAS CHARLES BATTERSBY, General Manager of the Watford Division of the Eastern Gas Board, and MR. JOSEPH FREDERICK RUST, General Manager and Engineer of the Newport undertaking of the Wales Gas Board, and Chairman of the Newport Group Committee, are recipients of the M.B.E.

The British Empire Medal (Civil Division) is awarded to the following seven members of the gas industry: C. COULT, D.C.M. (Leading Stoker, Goole, North Eastern Gas Board); H. DALEY (Mains and Service Foreman, North Western Division, North Thames Gas Board); J. H. OXLEY (District Gasfitting Foreman, Sheffield, East Midlands Gas Board); W. PURDEW (Engineering Foreman, Cambridge, Eastern Gas Board); C. ROBERTSON (Senior Mains and Service Inspector, Dundee, Scottish Gas Board); G. SEAGGER (General Foreman, Kingston, South Eastern Gas Board); and H. VINCENT (Valveman, Luton, Eastern Gas Board).

Other honours of interest to the gas industry included:— Knighthood: MR. S. GORDON RUSSELL, C.B.E., Director of the Council of Industrial Design. K.B.E.: Colonel Ralph Stephenson Clarke, M.P. for East Grinstead (for political and public services). G.C.B.: Sir John P. R. Maud, Permanent Secretary, Ministry of Fuel and Power. C.B.E.: Mr. Isaac W. Cumberbatch, Chairman of the West Midlands Division, National Coal Board; and Mr. C. T. Melling, Chairman of the Eastern Electricity Board. O.B.E.: Mr. Herman R. Lindars (for services in the field of fuel efficiency).

DR. W. D. SCOTT, who recently relinquished his appointment with Monsanto Chemicals, Ltd., has joined British Tyre and Rubber Co., Ltd., as Personal Assistant to the Managing Director, Mr. P. W. Howard.

MR. J. BISHOP, who joined Nordac, Ltd., Chemical Engineers, Uxbridge, early in 1954 as General Manager, has now been appointed Managing Director. He was formerly on the staff of Newton Chambers & Co., Ltd., Thorncliffe.

MR. A. G. STEWART, Chairman and General Managing Director of Stewarts & Lloyds, Ltd., has been appointed President of the British Iron and Steel Federation from January 1, in succession to MR. G. H. LATHAM, Chairman and Managing Director of Whitehead Iron and Steel Company. SIR ERNEST LEVER, Chairman and Chief Executive of Richard Thomas and Baldwins and the Steel Company of Wales, has been appointed President-Elect of the Federation.

MR. H. W. BARNETT, London Manager for the Butterley Company and subsidiary Hughes & Lancaster, also Manager, Oxygen Division, resigned on December 31, 1954, after 18 years service. Mr. Barnett, who has had 30 years in engineering, both practical and commercial, is starting his own advertising business and intends to specialize in engineering and technical accounts. His temporary address is Room 15, Clarence House, Arthur Street, London, E.C.4.

MR. H. SUMBY, Chief Clerk in the Distribution Department of the Sunderland Unit of the Northern Gas Board, has retired after 48 years in the gas industry. His record of service was described as a 'fine achievement' by Mr. W. O. Kirkwood, Divisional General Manager of the Sunderland Division, when he presented Mr. Sumby with a silver tea set on behalf of the staff. Mr. R. Williamson, Chief Distribution Engineer at Sunderland, expressed the good wishes of the staff to Mr. Sumby.

MR. F. J. BENGOUGH has been appointed by the West Midlands Gas Board to the position of Senior Engineer of the Birmingham District, with effect from January 1. Other engineering appointments announced by the Board consequent on the retirement of Mr. R. G. Warr are those of MR. J. M. BROWN, as Engineer and Works Manager, Nechells Works; MR. F. GROCOTT, as Engineer and Works Manager, Saltley Works; MR. G. H. POTTER, as Deputy Works Engineer, Nechells Works; and MR. K. J. CRANE, as Technical Assistant to the Divisional Engineer.

MR. HORACE L. CLARKE has been appointed by the National Coal Board as Marketing Director of its North Eastern Division. He succeeds MR. CLAUDE E. WALES, who is retiring after holding this appointment since the coal industry was nationalised. Mr. Clarke will also assume the appointment of Regional Sales Manager of the Yorkshire Sales Region. He has served the coal industry for 33 years. From 1947 until 1954 he was Area Marketing Manager of the No. 3 (Rotherham) Area of the North Eastern Division. For the last six months he has held an appointment at the marketing headquarters of the North Eastern Division.

MR. J. F. MORRISSEY, J.P., Grimsby, has been appointed by the Minister of Fuel and Power to be a part-time member of the East Midlands Gas Board. Mr. Morrissey is a Director of Smethursts (Grimsby), Ltd., a subsidiary of Unilever, Ltd.

SIR EDGAR SYLVESTER, who was Chairman of the Gas Council from its inception until 1951, has been appointed consultant to the British dairying industry. He will arbitrate should any dispute arise between representatives of producers and distributors on the joint committee of the Milk Marketing Board.

SIR CLIFFORD RADCLIFFE, C.B.E., D.L., M.A., Kingston, Surrey, who was, until his retirement in December, Clerk and Solicitor to the Middlesex County Council, has been appointed by the Minister of Fuel and Power to be a part-time member of the North Thames Gas Board. The appointment dates from January 1.

MR. H. B. J. HART, who has been at Shipley since 1939 and has been Engineer and Manager there since nationalisation in 1947, has been appointed Engineer and Manager at Keighley in succession to MR. F. N. BOOTH, who has retired. Mr. Hart began his career with the old Chester United Gas Company in 1926 and stayed there until he went to Shipley.

SIR WILLIAM MCGILVRAY has been asked by the National Coal Board to continue as Director-General of Marketing for a further period. It is the Board's wish that he should confine himself mainly to questions of policy and divest himself of matters of detail. Accordingly, it is necessary to strengthen the Coal Board's Marketing Department at headquarters. MR. J. NORVAL, who has been Deputy Marketing Director of the North Eastern Division of the Coal Board since 1947, has accepted a senior appointment at the Coal Board's marketing headquarters in London to assist MR. R. H. THOMAS and MR. R. J. MOFFAT, who will continue to act as Deputy Directors-General of Marketing.

MR. CHRISTOPHER J. PRATT, A.M.I.CHEM.E., has been appointed by the Association of British Chemical Manufacturers as Work Study and Productivity Officer. Starting his career as a metallurgist with Associated Lead Manufacturers, Ltd., he was for four years chief metallurgist with J. W. Singer, Ltd., of Frome, and for six years industrial consultant on the staff of Associated Industrial Consultants, Ltd. Since 1952 he has been Chemical Engineer and Manager of the British Filter Division of Eimco (Great Britain), Ltd.

MR. J. SIMPSON has been appointed Joint Managing Director of Woodall-Duckham Construction Co., Ltd., as from January 1. Mr. Simpson joined the Company in February, 1926, and was for many years on the sales side of the Company's business. He joined the Board in 1946, and for the past nine years has been responsible for organizing the provision of supplies and services to enable the Company to carry out a rapidly expanding construction programme. Mr. Simpson has for a number of years been closely in touch with the affairs of the S.B.G.I., and is at the present time Chairman of Council. He is a chartered gas engineer, having spent a number of years in the Scottish gas industry before he joined the Company.

MR. J. S. JEFFREY has resigned his position as Joint Managing Director and has retired from the Board of Woodall-Duckham Construction Co., Ltd., as from December 31, in accordance with the retirement rules of the Company. He will retain his Directorship of the Parent Company—Woodall-Duckham, Ltd.—as well as the other Directorships which he holds on behalf of the Woodall-Duckham Group, namely, Chairman of Nederlandsche Ovenbouw Maatschappij N.V., Deputy Chairman of W. J. Jenkins & Co., Ltd., and Director of the International Furnace Equipment Co., Ltd. Mr. Jeffrey joined the staff of Woodall-Duckham Construction Co., Ltd., in 1912 and was for many years in charge of the sales department for gasworks plant. He has served as Joint Managing Director since 1948.

MR. W. R. OLIVER, who was appointed Public Relations Officer to the East Midlands Gas Board at vesting date, but who has been on sick leave for a considerable time, terminated his service with the Board on December 31. For some years before the war Mr. Oliver was an executive officer of the British Commercial Gas Association. In 1940 he joined the Ministry of Food, and two years later went to the B.B.C. as P.R.O., war correspondent and topicality broadcaster in Northern Ireland. In 1943 Mr. Oliver went to Cairo as Inspector of M.O.I. posts in the Middle East and technical adviser, visual propaganda. Friends in the gas industry who would like to keep in touch with Mr. Oliver may be interested to know that his address is Calle Camino de la Bananova, 31, Corp Mari, Palma de Mallorca, Spain. A number of people write to Mr. Oliver for information about holidays in Mallorca, and he would be happy to write to anyone interested if they enclose two International Reply Coupons.

Holywood (Co. Down) Urban Council has decided to send a deputation to Belfast Corporation Gas Committee to discuss the price of gas in Holywood, which, it asserts, is too high. Objections were raised at a previous meeting, and Bangor Urban Council was asked to give an estimate of the cost of extending its main to Holywood.

Obituary

MR. GEORGE HANNA, whose death has been announced, was formerly Manager of the Cookstown Gas Light and Power Company. When the Electricity Board came to Cookstown over 20 years ago he was appointed its District Engineer, a post which he held up till the time of his death.

MR. WILLIAM BLAKELEY, formerly Managing Director of Firth Blakeley, Sons, and Co., Ltd., died after a very short illness at his home in Church Fenton, Yorkshire, on December 18. He was in his 78th year. Mr. Blakeley had been with the firm since it was established in 1894, and until a few months ago took an active part in the Company's business. He gained a wide and intimate knowledge of gasholder and gasworks plant construction, to which he devoted the whole of his working life. He was a member of a number of professional bodies including the Institution of Gas Engineers, and was also actively interested in the Royal Society of Arts.

MR. JOHN FRANCIS WAIGHT, B.SC. (Eng.) (Lond.), Industrial Engineer to the West Midlands Gas Board since October, 1952, died on December 21, at his home in Sutton Coldfield, aged 44. He was born in London and was educated at Charlton Central School and Woolwich Polytechnic, where he took a B.SC.(ENG.) Degree of the University of London. He joined the South Metropolitan Gas Company in 1926, received training in the industrial workshops, laboratory, and on the district, and was appointed an industrial engineer in 1935. During his service with the South Metropolitan Company he was associated with the late Mr. Dean Chandler on the design, installation, and maintenance of gas-fired industrial plant and also with the development work connected with such plant. In December, 1945, he was appointed Assistant Superintendent to the Industrial Department of the City of Birmingham Gas Department, later to become Superintendent and, after the nationalisation of the gas industry, was appointed Industrial Engineer to the West Midlands Gas Board in 1952. He was the author of several important technical contributions concerning various aspects of the industrial utilization of town gas, was awarded the Dieterichs Memorial Prize for his paper on 'The Design of Tunnel Burners' read at the meeting of the Institution of Gas Engineers in 1951 and the W. H. A. Robertson Medal of the Institute of Metals for his paper 'Gas Equipment for the Thermal Treatment of Non-Ferrous Metals and Alloys', presented at the Institute's annual meeting in 1952. He also served on the Board of Examiners of the Institution of Gas Engineers from 1948 to 1950. Married in 1934, Mr. Waight is survived by a widow and two daughters.

Correspondence

CHEQUE ENDORSEMENT

SIR,—The Chartered Institute of Secretaries is prepared to support an appropriate legislative measure which would abolish the endorsement of cheques paid by the payee into his bank account. The Bill introduced into the House of Commons on December 21 purports to do this by creating a legal fiction of endorsement by the stamp of the collecting bank. Amendment such as this of the Bills of Exchange Act, 1882, is not devoid, however, of present and future difficulty; the passage of a Bill through Parliament is not a foregone conclusion; and the legislative solution lacks flexibility, restricts experiment, and cannot avoid dependence for its success upon public response.

It should not be overlooked, therefore, that current banking law and practice already provide for the payment of a cheque without endorsement. This suggests that careful consideration should be given to the adoption of ways and means to encourage the general use of 'crossed bearer' cheques, instead of 'order' cheques. There is involved no alteration in the existing system and, *inter alia*, negotiable cheques would remain available to those whose requirements cannot be met in any other convenient way.

Bearer cheques crossed 'not negotiable' obviate endorsement and occasion no loss of protection. The only limitation is that, although freely transferable, they cannot be rendered negotiable. This, however, does not result in appreciable or insurmountable inconvenience, only three cheques in every hundred being negotiated, usually by persons who have no bank accounts to get cash.

Extension of the use of bearer cheques crossed 'not negotiable' could be facilitated and expedited (a) if it is made clear to the public that such cheques are not the relatively insecure instruments they are erroneously often thought to be; (b) if professional and business organizations recommended their use; (c) if the large users of cheques set the example; and (d) if the banks issued distinctive bearer cheques so crossed, except when otherwise requested by their customers. It should be added that, as Chairman of the Cheque Endorsement Committee of the Institute, I have received more letters advocating 'crossed bearer' cheques than others containing constructive suggestions. The Institute is grateful to all its correspondents, some of whom are your readers.

Yours faithfully,
J. R. W. ALEXANDER.

Chartered Institute of Secretaries,
14, New Bridge Street, E.C.4.
December 22, 1954.

*Human Relations in Industry**

By KENNETH E. STRINGER† and KENNETH P. DUNCAN§

THERE has been for years a growing realization that all was not as it should be within industry. Managers and employees' organizations alike have expressed disappointment with the progress towards truly harmonious working and it is significant that in March, 1953, a Joint Committee of the Department of Scientific and Industrial Research and the Medical Research Council was set up with Government approval 'To examine current activities concerning the study of human relations in industry and to call attention to problems of special timeliness and promise on which research, including applied research and field study, might be undertaken or supported.' Its first programme of fields for research has just been published.

To ensure that we are thinking on similar lines we must try to define our terms. Exact definition is not easy, but in its present context we would suggest that the study of human relations is the study of:—

1. What makes people tick and what causes them to do what they do, when they do it.
2. What are the thoughts and actions, conscious and subconscious, which transmute management into leadership.
3. Whether it is practicable for the industrial environment to be organized and adapted to recognize that man is and gives of his best only when he is free, able to exercise self-determination and convinced of the rightness or wrongness of any situation.

From this study we are enabled to understand many ailments of the industrial body and to find that, as in the human body, the sickness is not only a matter of germs and growths but of the underlying man. It is a medical platitude that no two cases are the same and the reason for that is not that the viruses or diseased cells differ but that the men vary. One man's meat is said to be another man's poison; one treatment succeeds in one case and yet makes another, clinically similar, worse. Study, analyze, investigate as we may, we cannot find an adequate explanation for the individual variations in response to disease processes. We are left with the word individual—the difference is there and must be allowed for. One can carry the analogy further and say that just as the cleverest scientist is not necessarily the best handler of a medical condition as it affects a patient, so the most skilful engineer may not be the best co-ordinator of human effort.

The true test of a man's belief is not his profession of faith but his actions, and further than that, the sincerity of purpose behind those actions. To assess a man's approach to the problems of human relations you have to know what he does when he is placed in a position of control of people. We have all seen the man who pays impassioned lip service to an ideal or belief and who, within the hour, has failed to live up to it. It is in the day-to-day personal contacts that this defection becomes manifest. You cannot be a good leader unless you realize that the other man has a point of view and that he could be right, and that when he is right the fact should be acknowledged and acted upon and the effect should be visible. Henry Ford, Senior, is quoted as having said: 'I want no more technical engineers; I only want human engineers.' He said that because he had achieved near technical perfection but felt something still to be missing.

In any group someone will emerge to set the tempo of the human relations. Someone will be in the position of authority but if he fails to take his greater opportunities the climate will be set by one from the ranks of those who could have been led. To put it another way, an essential function of management will have been given away or neglected. It may be that those with a scientific background are particularly at fault in this respect. After spending years dealing with hard, concrete facts, and with actions which produce inevitable reactions, it is not surprising that they may sometimes fail to adapt themselves to a new dimension and to accept that the addition of the individual varying factor may upset apparently obvious calculations. There is no denying that it is much harder to grasp and hold an unmeasurable concept than to control by gauges the production or distribution of a product that follows definable, mathematical, scientific laws.

Coupled with this fact that human behaviour follows no clearly defined pattern is the changing climate in industry. The situation in which human nature operates within industry today is so vastly different from that prevailing even 15 or 20 years ago. The past 20 years have been a period of rational evolution that would, 50 years ago, have been regarded as revolution. In our view future historians will be entitled to compare the changing events of the first half of the nineteen hundreds to the industrial revolution of the nineteenth century. True the changes may have been less spectacular, but they have been none the less effective and fundamental.

If, therefore, the tempo of human relations is to be properly attuned by management, they must recognize these facts and not merely regret them. They must, moreover, achieve results in spite of the fact that their training and experience have been drawn from the past and acquired in an environment vastly different from that which prevails today. In the final analysis they must accept the fact that human relationships in industry for the future cannot and will not be merely an extension of the past.

Evolution of Human Relations in Industry

In the days when Britain was essentially an agricultural community, such industry as there was was mainly of the 'cottage' type. In other words, the numbers employed were small, all lived in close proximity and often shared the same table. The employer was not of, but was among, the employed, and both probably were where they were by right of birth and by long tradition. It was a much more static society altogether and the family spirit, with the employer representing the head of the family, was strong. He had his rights, which were to be respected, but, by and large, he acknowledged his duties, which were to be performed. In the space of two generations the industrial revolution changed all this. The employer was no longer a man who had always accepted the demands made on him by his position, but was a man who had reached his eminence by a certain mechanical ability. The numbers employed per employer grew rapidly, and whole new communities, without tradition, without roots and without loyalties, flocked to the working of the new machines. It was a time of great extremes and a society which had had fixed and almost unchangeable classes became a society where class changes could be made but where, paradoxically, the gulf between the classes grew even wider. Many terrible charges have been laid at the door of the new employers but, in retrospect, it is probably a fairer historical verdict to talk of their ignorance than of their rapacity. The need for good human relations was not seen to exist and the consequence is a page of history which makes dark reading in the twentieth century. Let us be careful of our more sweeping judgments; it is very unlikely that the twentieth will be thought of by succeeding generations as an age of sweetness and light.

It makes extraordinary reading to us that less than 150 years ago there should be the Combination Acts, passed by Pitt's Government, which forbade, under heavy penalty, any attempt by the workers to unite to negotiate for better conditions. It is perhaps not so surprising that bands of men called Luddites should have ranged the country destroying the machines which they saw as the destroyers of all their previous way of life. It is all very well to say that these men were shortsighted and failed to see how the general

* Presented to the Western Junior Gas Association on December 4, 1954.

† Personnel Manager, South Western Gas Board.

§ Chief Medical Officer, South Western Gas Board.

standard of living and national prosperity could be advanced by the new methods; these more distant views were by no means obvious and the disadvantages of the changes were all too apparent. It is not strange that such a complete social revolution should have found men unready for it, and it is in many ways encouraging to find in the ranks of the social reformers many who stood to make substantial gains from unrestricted irresponsible development.

The name of Robert Owen springs to mind and it is worth dwelling on this remarkable man for a short space. Himself a manufacturer in the cotton belt, he made his New Lanark Mills a model of all that was best in the light of the knowledge of his time. He saw past the machines to the men and women who controlled them and he saw the human needs that were there. The humanitarian movement of the early nineteenth century was no airy-fairy theoretical dream of impractical men. Peel, Owen, Shaftesbury and all the others known and unknown were not members of any extremist political party engaged on a vote-catching witch hunt. The political power of those whom they wished to help was almost negligible, which is a state of affairs hard to remember in these days of a wider franchise. This whole episode is misunderstood if it is interpreted in terms of twentieth century 'right' and 'left'; it can be judged much better on more lasting moral principles of right and wrong. As is so often found in our history it was voluntary action by enlightened men that gave the lead and the consolidation was achieved by legislation in the gradually strengthening series of Acts of Parliament controlling conditions of labour throughout the nineteenth and our own century.

It has to be borne in mind, too, that those who so apparently unreasonably opposed many of the earlier attempts to improve the lot of the labourer were filled with quite understandable anxieties aroused by the excesses of the French Revolution and were fearful that such a blood bath might be in store for our own country. That it was not so was due to many factors—the power of the new evangelical revival, the less excitable nature of our people and the presence in the ranks of the privileged classes of some men of vision, who caused changes by the more gradual means of evolution. Understanding of human relations in industry, even at this early stage, had shown its significance.

Advances after the First World War

As the franchise widened and the new trade unions grew, the position changed. Any moves made by the unions were certainly suspect, an attitude not unknown today, but the arts of management were being learned, albeit slowly, in the school of experience, and a certain minimum legal standard was maintained. The 1914-18 war led to advances in the study of productivity and in the new science of personnel management. Into the field came the industrial psychologist and, as so often happens, when the theoreticians swim in practical waters they all went slightly mad. The whole subject became so materialistic that, in the words of Dr. J. A. C. Brown in 'The Social Psychology of Industry'—'It seemed as if the ideal factory should be fashioned in the style of a model cowhouse, the milch cows of which were the industrial workers'. Men could be conditioned to produce more and more for less and would do it even better to music while they worked. When the theories failed in practice everyone seemed surprised. The 'little economic men' envisaged in their theses had been miscalculated. They were individuals, not units; they had emotions, not electronic brains; they had human dignity which needed understanding, not ergs which needed calculating. For the second time in history, and this time through pseudo-knowledge, not ignorance, the study of human relations in industry had been forgotten.

In fairness, it may be true to recognize that problems of human relations were perforce pushed aside at this time as employers and trade union leaders had to grapple with post-war difficulties of extravagant currency fluctuations abroad, deflation at home, high tariff barriers to British trade abroad and the obvious necessity for some rationalisation in the basic industries simultaneously with the development of new industries.

An economic blizzard hit the industries unsheltered from foreign competition and this in its train set up an internal conflict with those employed in sheltered industries. All these problems culminated in the tragedies of 1926. Fortunately, however, some men had learned a lesson. They realized that if similar situations were to avoided in the future, then, regardless of the magnitude of other problems, it was essential and necessary for the problems of human relations to be considered at the outset and, if necessary in the solution of these problems, to go to great lengths of mutual concession to avoid open conflict. These men were, by 1930, conditioned to substantial changes in outlook and approach and were possessed of a real determination to avoid the loss and misery that arose from industrial conflicts.

Human Values

If one compares the end results of the depression of 1921 with those of 1930-1933, the latter case history shows that both from the ranks of the employers and the trade unions there were men in authority who were prepared to place human values before economic ones. They were prepared to recognize that if industry was to succeed along the course that was set, then a new type of worker was required. It would no longer be a question of the hiring of muscle and brawn; industry needed men who were alert and actively capable of adapting themselves to changes in technique, even at short notice. Further, they recognized—and this is important from our point—that the new men in industry would be more sensitive to their treatment and conditions of work, more forceful in expressing their rights, if they were required to accept new responsibilities, and so gradually throughout the 1930's these men played a great part in developing, through joint negotiation and consultation at local, regional and national level, a *modus operandi* which gave recognition to these facts. This was indeed a tremendous step forward.

The progress of industrial and economic evolution was constantly bringing forward new problems. Short term and long term plans had to be brought out to ensure that complete systems of machinery for negotiation and consultation were devised to suit different industries and types of industry.

Unfortunately, in our view, at this stage the scope of industrial relations seemed to be limited to a somewhat formal plane of negotiation on such matters as wages, hours of work, etc. While accepting that there is obviously a need for humanity in the approach to the study of this aspect of industrial relations, it is a complete fallacy to expect that the agreements which result from such deliberations are in themselves enough. Good 'personnel management' will embrace good industrial relations, but a phrase that is of much more importance than that is 'personal management' and the latter is what we are really concerning ourselves with today.

Present-day Position in its Extremes

One might define the possible extreme views on this subject as being on the one hand the tendency to wrap the worker in cotton-wool, and, on the other, the belief in the 'survival of the fittest' as an effective practical doctrine of man management.

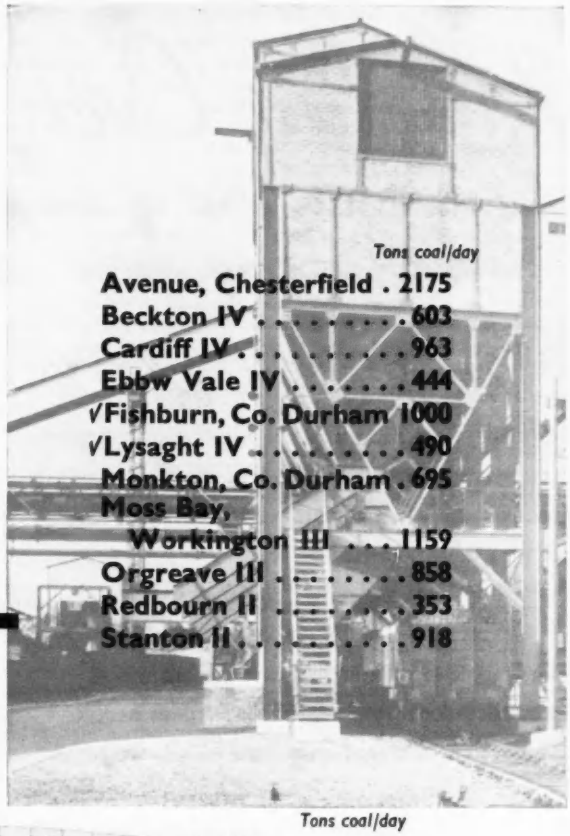
If you accept that managements have a responsibility for the care of those whom they employ and put no limits on that responsibility, it is a relatively small step to the grandmotherly fussing that some would advocate. Sentiment and sentimentality have become so confused that any harrowing tale is sure of its tear-stained eye. Some of the cases brought before the Courts under Common Law appear to rest solely on this facile emotionalism and the man who tries to analyze their merits rationally runs grave risk of being condemned as a heartless devil who does not sufficiently love his fellowmen. The causes of an accident have to be clearly differentiated from its consequences, and right and proper sympathy for a victim should not inevitably bring in its train condemnation of an employer.

As a practical concession to the popular dream there are those industrial temples where no expense has been spared to provide that facade of anxious care which is thought to indicate the good, kind management. Elaborate, uncontrolled, non-contributory sick pay and pension schemes, waves of eager-faced welfare workers, cargoes of canteen workers, droves of doctors and shoals of shining equipment ensure that no conceivable request of the worker for solace, nutrition or sport can ever be delayed for an hour. The crowning glory was the attempt in a Yorkshire mill to introduce beds into the workshops to ensure that the employees relaxed sufficiently! These

W-D in 1954 were "on site" building

11 NEW COKING PLANTS

26 NEW GASMAKING PLANTS



	Tons coal/day
Avenue, Chesterfield	2175
Beckton IV	603
Cardiff IV	963
Ebbw Vale IV	444
√Fishburn, Co. Durham	1000
√Lysaght IV	490
Monkton, Co. Durham	695
Moss Bay, Workington III	1159
Orgreave III	858
Redbourn II	353
Stanton II	918

	Tons coal/day
Aberdeen V	175
√Boston	96
√Brighton III	406
Christchurch, New Zealand	150
√Croydon IV	270
√Derby II	380
√Derby III	380
Dover	341
East Cowes	245
√Edinburgh IV	259
Edinburgh V	259
Exeter	377

	Tons coal/day
Gainsborough III	18
Glasgow Provan II	436
Glasgow Tradeston II	179
Grimsby VI	80
Irvine III	18
√Jersey	190
√Lincoln IV	138
Rotherham	617
√Smethwick III	205
Solihull III	50
Tingley II	511
√Tottenham V	93
Walsall II	821

Kensal Green Complete Gasification Plant.

√ Completed and put to work.

The figures following the contract names denote the number of W-D installations at this Works.

W-D

WOODALL-DUCKHAM

CONSTRUCTION COMPANY LTD.

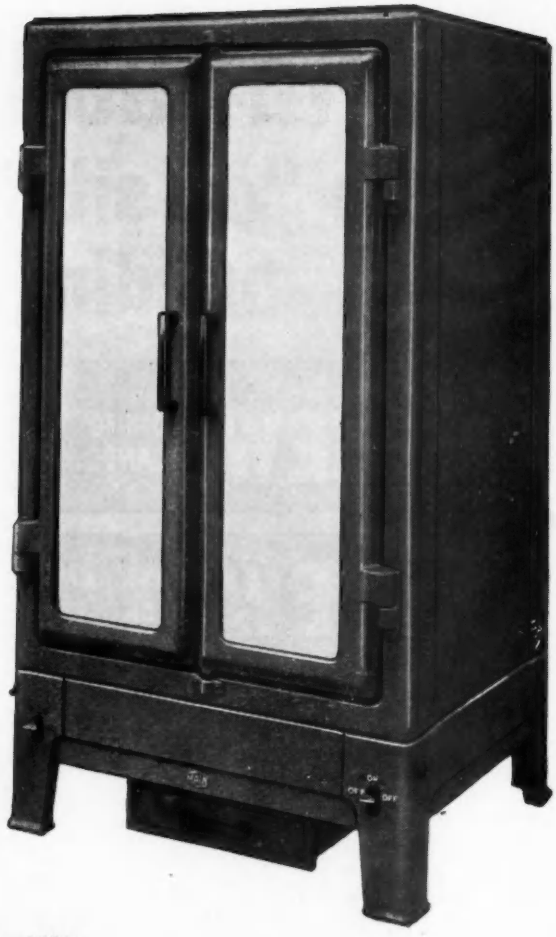
Woodall-Duckham House, 63-77 Brompton Road, London, S.W.3.

Telegrams: Retortical (Southkens) London Telephone: KENsington 6355 (10 lines)

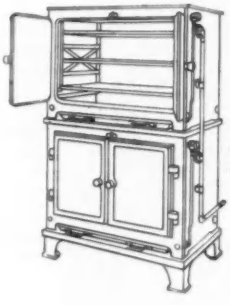
Roasting Oven

that makes the most of every inch of cooking space

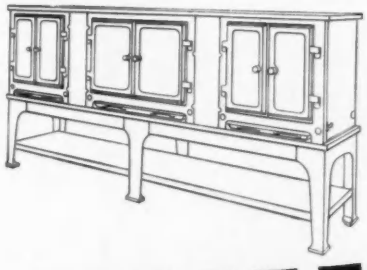
This large Roasting Oven . . . one of an extensive range of Main designs . . . has an interior oven size 30″ wide x 30″ deep x 48″ high. Efficiently heated by two atmospheric burners the oven has enamelled steel linings and is fitted with three grid shelves carried on removable side hangers. The appliance is strongly constructed, mainly of cast iron, and is finished externally in Dapple Grey Vitreous enamel with white enamelled door panels and bakelite door handles. The oven is mounted on enamelled cast-iron feet and the storage pan under the oven is of copper with an enamelled cast-iron front.



other types of roasting oven



A Vertical Battery of two ovens on a short stand.



An Elevated Battery of roasting and general-purpose ovens.

Gas and Steam

MAIN

COOKING and SERVICE EQUIPMENT

STEAMERS
HOT CLOSETS
BOILING PANS
ROASTING OVENS
GAS RANGES
FISH FRYERS

R. & A. MAIN LTD., LONDON and FALKIRK

our "Planned Kitchencraft" Department is at your service

If you have a catering problem consult R. & A. Main Limited. Our organisation, backed by years of experience in planning and equipping kitchens of all sizes, will gladly work with you in developing your own ideas or submit plans for your kitchen.

monstrous, materialistic temples, dedicated to the gods of self-deception, are held to represent a good industry. Their cost comes mainly from money which would otherwise go in taxation; in other words they are paid for by the State under present-day conditions.

Then there is the other extreme to be considered. There still are in this country many premises used as factories which barely satisfy the minimum legal requirements. There are, too, non-industrial occupations which have progressed little in one hundred years. There are still those who accept no other responsibility as managers than the duty of making money. In the smaller industries attempts to improve conditions are often vetoed on the grounds of expense and it must be admitted that they do present a difficult problem. However great the obstacles to the enlargement of available physical amenities there seems little defence for the casual attitude that so many of those in this group have towards their responsibilties.

Between the hard-hearted minimum letter of the law attitude, on the one hand, and the soft-headed plush materialism on the other, there must be the mean course. To arrive at it it is necessary to get right back to first principles.

Assessment of the Correct Middle Course

Underlying these fundamental factors is the necessity in a free country for a man to have freedom to choose his job and freedom to spend the earnings of his labour as he wishes. This deeply ingrained love of freedom can cause friction as to how the job is done. If work is to be reasonably organized an adjustment has to be made; a balance has to be struck between the restriction of freedom that is servitude and the excess of liberty which is licence.

(a) What Does a Man Want from his Job?

He wants position and finance to provide him with the standard of living which he considers reasonable. He wants to be able to hold his head high in society; he wants to be considered a success—someone who has taken part in the economic competition, and come out better than most. He wants to be able to keep up with 'the Jones's.' He wants at least to maintain that standard of life for himself and his family which he is used to, because what one is used to usually governs one's opinion of what is right. If possible he wants just a little bit more than he is used to, so that he may give his children a better start in life than he had. If he does not worry about these comparisons probably his wife does and nags him until either he leaves her or leaves the employment.

He requires the maximum amount of satisfaction out of his job. He is awake probably for about sixteen hours a day, half of which are spent at work. If this half of his life is not merely to be a drudgery and a tedious means to an end he must gain some satisfaction from it. Two hundred years ago, when most goods were produced by craftsmen doing a part of the productive process of an individual article, it was easy for a workman to see his end product and to take an interest in it. Today, when some men may be required during their working hours to do no more than keep putting coke into bags, this is not so easy, but much can still be done by helping the employee to enjoy a sense of achievement in the output of the team to which he belongs.

He wants his work to be as safe as possible. Everyone is susceptible to the longing for the strong, healthy, unmaimed body, and one has only to look at the advertisements of patent medicine manufacturers to realize the strength of this appeal. It is therefore not unnatural that a man should expect everything possible to be done to keep him intact. It is true that familiarity with hazards tends to breed contempt of them, and men often do not bother to use the safety equipment which is provided, yet in the cold analysis which a man uses when deciding whether or not to take a job, safety in his work is ranked quite high; this stems often from domestic pressure, though there are signs of increasing attention to this aspect. Following the report of the Dale Committee on the use of medical manpower, with particular reference to its use in industry, the Government has recently announced a new investigation to see how the voluntary medical and first-aid services within industry can be increased and extended by, if necessary, the use of statutory powers. It may well be that the end result of all this in a number of years will be some form of national industrial medical service.

All men desire equitable treatment. Educational opportunities grow ever wider and class boundaries ever narrower. It is no longer enough to say, if it ever was, 'I am the employer and I consider this to be fair.' Each employee will demand for himself a fair crack of the whip and will not be satisfied that he has had it unless the fairness is made apparent; in other words, there must be no hidden diplomacy. Men may be prepared to put up with poor conditions and low wages provided that equity is demonstrated; conversely, high wages and good working conditions will not bring industrial harmony if employees suspect that some of their fellow workers are given an unfair advantage over them.

A man wants a share in the management. We are now getting on to controversial ground where there is no universally accepted answer. It may be true that some of the most successful employers have been the stern, just men who would tolerate no interference with their management prerogative, and men respected them because they knew just where they stood. The giving of clear, consistent direction does breed a feeling of security, but not all men will serve a dictator. To get this clarity of direction in the large and complex organizations common today it is essential that all levels of management must be in the picture and must be able to implement the central policy.

There is the feeling that not only shareholders invest in a business and take the risks it entails but so also do all employees who acquire skills which are mainly and frequently solely applicable to one industry, or even to one firm. Some risk is implicit, but disaster is far more tragic if loose management of a firm causes its downfall with the result that the investment of their skill is wholly or partially lost. If this thesis is accepted, it is difficult to deny that workmen have a right to a say in the management of their undertaking, in order that they may safeguard what they have at stake. The corollary must also be added that the workers must be prepared to train for their responsibilities and must accept them.

(b) What Does Industry Require of a Man?

Industry requires, in the first instance, good workmanship. When an employee is engaged, a contract of service is made under which, in return for specified rewards, he undertakes to do a certain job. The employer by law must keep his side of the bargain and pay the agreed wages so long as the man continues in his employ, and he therefore has a right to expect that, as a matter of common justice, the employee should also keep his side of the bargain; to fail in this is a breach of faith, no less so because such failures are seldom remediable by the course of law.

Not only in quantity does industry require a man to give satisfaction, but also in quality. An agreed wage has been established, principally by bi-lateral bargaining, always on the understanding that it is paid for a reasonable day's work. An employer who pays this rate has the right to expect the employee to keep his side of the bargain.

Industry also requires loyalty to the group. Few men work alone; most men work as members of the team, where a will to further the work of the whole team and to sacrifice, to some degree, many individual self-interests to the benefit of the whole team is essential to the smooth and efficient working of the industry. A man should give to his organization something of that sense of regimental pride which the Services foster. He has his rights and must accept his duties.

If it is accepted that a man must have a share in management it is reasonable to request that an employee will contribute constructively to its efficient progress. That is implied in the principle of joint consultation, when the suggestions made should be constructive and aimed at the progressive advancement of the industry and not necessarily defensive of one group of interests or critical of management simply because it is management. Those with a real stake and interest in an industry are much less likely to be pre-occupied with restrictive practices.

(c) The Contribution of Industry to Society

The most important contribution is to give a service to the nation by producing, with the greatest possible efficiency, the goods that consumers at home and abroad want. Failure to do

this results in a wastage of the nation's scarce resources in labour, capital and land, and eventually an inability to maintain the standard of living.

Industry should contribute to the economic stability of the nation. By restraint and far-sightedness it is possible to minimize undesirable oscillations in the level of business activity. In times of inflation it can refuse to join the merry-go-round and instead continue a sober policy of progress. In times of deflation it can then carry on as a vital contribution to economic and social stability. That many national and commercial organizations do, in fact, play this rôle can be seen by examining the dividend policies which not infrequently transform ordinary shares virtually into debentures.

Industry can and does make its contribution to the management of the country, both physically and economically. This has always been so from earliest times and, while the obvious effect may in some degree have been lessened by our present democratic system, it is still strong through its influence in political parties, as well as its more physical representation in the House of Lords brought about by the widening spectrum of choice of peers. While this may in some ways be considered as a negation of democracy, yet industry has a big stake in overall economy and therefore industry should be represented. It is not claimed that ours is a totally logical form of government; it is claimed that it is highly practical.

There is also a contribution to be made to public health. Apart from the obvious need for prevention of specific industrial diseases and of pollution of surrounding atmospheres, industry can make a great contribution to the general health of the community, both by producing goods which are conducive to health and providing working conditions which prevent unnecessary exposure of employees to physical hazards. When we talk of the stress diseases and of the psycho-neuroses to which our age is depressingly subject, we must bear in mind that they are part of the public health problem in this sense just as much as the more direct aspects of infection and known occupational poisons.

The work, wealth, and happiness of man cannot be separated from his health. The human body and, probably more importantly, the human mind, have had to adapt themselves to enormous changes in environment and routine in the past century. At present we understand only very little of all the factors that contribute towards the full maintenance of health, but we are becoming increasingly aware of the need to study the whole man—body, mind, and soul. It is a rather sad fact that while we are all living longer on the average and while the scientific side of medicine has made great advances, we do not seem to live any more happily, or to attain higher overall standards of real health. The study of this interaction of mind and body in a changing, ever more hurried, world appears to hold the key.

Finally, industry can do much for the development of the individual. Most employees start work at the age of sixteen, which is when they are physically and mentally still incompletely developed. They can and must be guided into the right channels so that their mental powers are further developed and they are launched on to their working life with the right social attitude in that each realizes his obligations to his fellows.

Skills which are taught to youngsters are useful not only to the industry in which they are immediately engaged, but they enrich the pool of skill which is the nation's greatest asset. This is further education at its most practical and if a nation's capital is in its working skills, this is capital appreciation at its best.

What is the Correct Middle Course?

There can be no arbitrary scientific standard answers to problems of human relationship, but there are guiding principles and basic considerations which must always be borne in mind. What appears ideal in 1954 will be thought to fall far short of the mark in 2054, but we must set our standards by measures of the society in which we live. It is a national characteristic to move by stages, by rational evolution, not by revolution, and that is bound to be the way of progress in this field. The minimum standard is prescribed by legislation and by the interpretation of that legislation, but we submit that that is not enough and that more than the letter of the law must be done. How much more is done depends, in practice, on a number of factors. Whether it should in theory be influenced by so many variables may be a moot point; the fact of the matter is that it is.

Probably the main governing factor is the type of management and the size of the organization. If the industry is small and skilled, or semi-skilled, and is run by its owners, the human factors tend to get their due place, but as private combines become wider and larger and as scattered small industries become grouped, either under large companies or under the State, this essentially personal element may be diminished. The climate of human relations in these larger groupings may be determined by the essential humanity, or otherwise, of the 'higher-ups,' but the day-to-day implementation of even the most enlightened policies can fall down utterly if local officials fail to grasp its importance. To the workman in some distant part of a large industrial empire it is not his feeling towards the managing director that matters but his relationship with his immediate manager.

Many employees have an instinctive suspicion of the activities of their remote controllers and it is only if they see a willingness to work happily with them, shown by their local officials, that they will give their loyalty to the larger group. Without this local effort the best board room intentions can be, and will be, gravely misinterpreted.

It is probably fair to say that a really big group rarely achieves as good relations as a personally-run small one, though in our view this need not be, but it is important to add that it rarely sinks as low as a badly-run small one which is unprofitable or has an uncompromising or arrogant owner-master. Some of these small, precariously financed, industries provide the black spots of industrial conditions at the present time and they have the inherent evils of any despotism. A benevolent dictatorship may be the best form of government but unfortunately it rarely seems to stay benevolent.

On the other side of the picture, human relations in industry are influenced by the strength of the workers' organizations. The real, important strength of a union is related not necessarily to its numbers or to its power of agitation, but to the balanced realism of its leaders. Given a union strong in this sense and an enlightened management, anxious at all levels to secure good human relationships within the group, it would appear that these relationships should inevitably follow, but that is, unfortunately, not necessarily axiomatic; there are certain outside influences which can upset the balance.

The overall economy, the supply and demand of labour, the state of the market for the industry's product, all impose stresses and strains on these relationships, especially if they are grounded in expediency and not in sincerity. The economics of the situation—short and long term—can decide the fate of many a project for betterment and in regard to all these external factors it has to be borne in mind that there are often sincere differences in viewpoint which are inherent in the status as master or as man. Changes in the economics of a firm, for example, may force the question of redundancy and impose a great strain, which only a very secure organization can bear without grave damage to its human relations.

In addition to all these material facts there are certain moral, philosophical, and psychological principles which this analysis dare not ignore. If you say that a man has a moral responsibility towards those under him, if you say that what you want is practical Christianity, or any other ethical code, to find its expression in the day-to-day working life of both master and man, can you follow that by saying, under your breath if necessary, 'depending on the economics of the situation'? How far can you follow the scheme of laying down absolute moral 'black' and 'white' in an imperfectly grey world? This is the crux of the problem. Can there be, for example, such a thing as a commercial risk where the safety of another man is involved? The emotional answer is so obvious and yet it appears to be historical fact that more has been achieved by men with the heart of the matter in them but with hard heads than by men with the highest objectives who were ruled by their emotions. Arguing purely on a theoretical basis there are many amenities and services which one could urge that would in some way have a chance of safeguarding the health of the workers in any industry. It would be perfectly easy to defend the usefulness and the wisdom of all these possible developments and to urge that everything that could be done should be done. The cost could be enormous, but if it were not considered, the opposition to these suggestions could be very slight. An industry trying to implement all these idealistic

(*Concluded on p. 46*)

Instrumentation in the Gas Industry*

A Review of Recent Developments

By T. A. LUCAS, B.SC., A.R.C.S., A.INST.P.†

FOR gas flow measurement, the Pitot tube is a satisfactory laboratory instrument, but it may be necessary, when using it for industrial purposes, to measure the differential pressure under difficult conditions. When it is further realised that, at a flow of 20 ft. per sec., or 226,000 cu.ft. per hour, in a 24-in. main the difference between static and dynamic pressures is only 1 mm. w.g., it will be seen that the Pitot tube is not satisfactory for all distribution problems.

An alternative instrument is the hot wire anemometer, which in its original form is capable of giving accurate results over a range of 0-5 ft. per sec., which, in a 24-in. main corresponds to 56,500 cu.ft. per hour. The original hot wire anemometers were resistance wires which were fed with a constant current, the rate of cooling being measured by the resistance of the wire. Considerable difficulties were encountered owing to the lack of stability, but L. F. G. Simmons, of the National Physical Laboratory, was able in 1946 to say that equivalent results could be produced even if the wire was completely isolated by a silica sheath. Using this type of anemometer it became apparent that the problem of 'drift' would no longer arise, and adequate stability could be obtained. Using this instrument, satisfactory calibration is obtained easily only over a range 0-5 ft. per sec.; so it is obvious that an instrument which could read from 5 ft. per sec. up to 40 ft. per sec. would be of great value. A modified form of hot wire anemometer, which has now been produced in the Central Laboratories of the South Eastern Gas Board, can adequately cover the range.

In this instrument the effects of contamination have been eliminated by mounting in a sealed silica tube a thermocouple and a small heater. To increase the range above 5 ft. per sec., the element is mounted in a bullet-shaped container which experiment has determined as satisfactory for the purpose. The principle of the device is that direct flow does not impinge on the element, but that flow round the bullet causes eddy effects of varying magnitude to arise at the thermocouple. It has been possible, using this device, to obtain satisfactory calibration figures up to 40 ft. per sec. in gas, and a working model has been produced which has been specially designed for distribution purposes. (Fig. 1.)

The heater is fed from two non-spill 2-volt accumulators, a rheostat and detecting bridge being incorporated, so that the current may be kept constant. The thermocouple is connected to a sensitive millivoltmeter, a potentiometer circuit being employed, so that the millivoltmeter is always brought back to the balance position in the bridge. It has been possible, using one millivoltmeter, to arrange for circuits which enable the heater current to be adjusted and the millivolt reading also to be adjusted by the use of two variable resistances, the millivoltmeter being used only for comparison purposes. The procedure for use is that the heater current is adjusted, and then the millivoltmeter is brought to its zero position by means of a second variable resistance. On the dial of the second variable resistance a flow scale is engraved and so velocity readings can be taken direct.

For practical field testing it has been possible to arrange the instrument on a basis of unit construction. The detecting bullet is mounted on a shaft carried by a gland, which can be introduced into any ½-in. hole. The measuring device has been incorporated in a portable box which also carries the accumulators. The third unit is a tripod on which the measuring box stands, enabling levelling to be carried out in locations where level surfaces are not available.

Extensive tests with the anemometer in air lines have indicated that the accuracy of the instrument is probably within ± 2 % of full-scale deflection and over long periods the calibration is maintained within these limits. When used in gas, however, the accuracy is no longer so high and it is suspected that variations in gas composition materially affect the reading. It has nevertheless been possible to make practical use of the instrument by calibrating on gas of approximately the same composition as that in which test results are required, and under these conditions accuracy of about ± 5% of full-scale deflection are obtained.

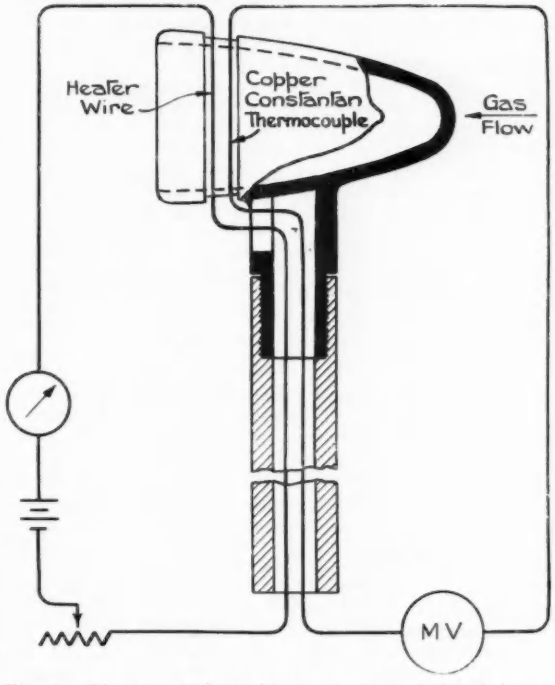


Fig. 1. Diagram of hot wire anemometer designed for gas distribution purposes.

The instrument is now finding an application in the measurement of air flows in coke-fired brick kilns. It has been found possible to measure the velocities of air flows with ease and accuracy, so that efficient performance can be attained.

Calorific Value

Two recent innovations are concerned respectively with the method of temperature measurement, and the method of compensation for barometric changes in the standard Fairweather recording calorimeter.

For recording the temperature difference, electrical resistance thermometers are employed, and in the standard pattern these thermometers are made with two arms of a Wheatstone bridge, the temperature difference being detected by means of the out-of-balance current in the bridge. This system relies for its accuracy on a cross-coil movement in the galvanometer, which compensates for changes in voltage of the batteries feeding the bridge. It suffers the limitation that the out-of-balance current of the bridge, which is, of course, non-linear with resistance change, has to be measured by an instrument capable of giving a linear calorific value reading. The system has

* From a paper to the London and Southern Junior Gas Association, December 10, 1954.

† South Eastern Gas Board.

recently been modified by the use of mechanical or electronic potentiometric instruments.

The Wheatstone bridge is still a standard circuit, but it is no longer necessary to stabilise the current to the bridge within narrow limits. The out-of-balance current in the bridge is detected by a galvanometer, and at intervals the galvanometer needle is mechanically clamped. The position of the clamped needle is detected by mechanical feelers, and the position of these feelers is used to actuate a clutch-mechanism. A synchronous motor, which is continuously rotating, is brought into play by the clutch-mechanism and moves a variable resistance in such a way that the bridge is restored to balance. The change in position of the variable resistance is, therefore, a measure of the unbalance of the bridge. This is really a substitution method, the change in the resistance in the thermometer arm being compensated for by the movement of the variable resistance. A linear scale is, therefore, automatically produced. Such a system has been found of particular value where wide changes in calorific value have to be measured—for example, in the measurement of the calorific value of blue and carburetted water gas—since the linear scale with its added width eliminates the necessity for change in the measuring instrument.

A modified form of Fairweather recording calorimeter, in which both the gas and water rates are maintained constant, is now available. In this pattern, changes in atmospheric pressure and temperature are detected in a small aerorthometer. Movements of mercury level are used to alter the resistance of a platinum wire which is partly immersed in the mercury, and the resistance is included in the leads from thermometer to recorder. Compensation for changes in atmospheric conditions is obtained electrically, and the calorimeter has thereby been made considerably smaller. It is hoped that these developments will not only reduce the cost of the apparatus, but will also enable the instrument to be installed in a room of normal ceiling height.

Specific Gravity

Commercial instruments have long been available which provide an accurate method of recording the specific gravity of gas. Satisfactory instruments for conducting spot checks on specific gravity have not, however, been so successful. To meet the need for an instrument suitable for this duty, the specific gravity balance, designed at the Fuel Research Station* as a laboratory instrument, has been modified and made suitable for works duties. The balance consisted of a light glass sphere which was connected to the balance arm, the sphere being surrounded by an outer glass sphere. Gas could be introduced into the inter-space between the two spheres and allowed to escape through a small hole. The inner sphere was connected to a balance arm, the whole unit being mounted upon an agate. The agate itself was positioned on a second fixed agate, so that a balance was available, the sphere providing one arm and the balance arm the other. The balance arm was graduated in units from one to ten, and two small riders were available, one being ten times the weight of the other. The main divisions were sub-divided into ten, so that a high degree of accuracy was available for balancing. In the modified instrument the glass spheres have been replaced by metal spheres, the inner sphere being of light aluminium. The diameter has been increased to ensure adequate thrust for operation. Suitable clamping devices are provided and the instrument has been mounted in a metal case which is readily portable.

The instrument has proved to be quite robust for works use and the spot determinations for specific gravity can be made within ± 0.002.

Process Control

Automatic control can be carried out by a variety of means, but all problems reduce to the same essentials. The unit to be controlled is generally referred to as the 'plant,' though it may be as simple as a piece of main with a butterfly valve, or as complex as a carburetted water gas plant. A measuring device must be provided to detect changes in the selected variable, and a valve must be provided to act on the plant and compensate for such changes. Lastly, a means of linking the measuring device to the valve is necessary, and this is the controller.

In many cases, the power needed to operate the valve can be supplied by the 'plant,' the use of governors for pressure control being a typical example, but in other cases an external source of power must be supplied. Further, in cases where a change in variable produces an immediate response in the measuring equipment, simple devices function adequately. If, however, there is an appreciable time lag between a change in the variable and the movement of the detecting element (*e.g.*, temperature control, where thermometer pockets cause an appreciable time lag), the problem is more difficult, and relatively complex equipment becomes necessary.

In cases where controllers of the self-acting type are not satisfactory it is possible to employ electrical, hydraulic, or pneumatic means. Safety considerations make electrical controllers unsatisfactory for many purposes in the gas industry, but both hydraulic and pneumatic controllers are employed. Pneumatic controllers are attractive on the grounds of flexibility and cost, and the applications to be considered have been carried out by pneumatic means. The pneumatic controllers considered operate from an air supply at 17 lb. per sq. in. provided from a compressor, provision being made for a stand-by unit in the event of a mechanical failure.

Certain recent developments concerned with pressure relate to the installation of automatic control systems, and three examples have been selected.

Control of Producer Gas to Coke Ovens.—At the plant considered two batteries of coke ovens were installed, and the heating of these ovens was carried out by producer gas manufactured in a separate producer plant. Under normal working conditions, the demand for producer gas remains constant, but at the change-over period on either battery the demand falls to 50% of the normal requirements. The standard method of dealing with this situation is the installation of a relief gasholder, but it was decided after due consideration that pneumatic equipment could be used to give equally satisfactory performances, without the necessity for a relief holder.

The controller installation consists of a 54-in. butterfly valve operated by a pressure controller, the valve being installed in the take-off line from the producers, and the pressure detected being that upstream of the valve. A 54-in. valve is required to move from the 'fully open' to the 'half open' position in about 10 sec. To ensure this, it has been necessary to install four diaphragm heads of the conventional type, each fitted with a valve positioner. At the change-over period, the demand falls to 50% at the ovens, and in consequence the pressure upstream of the butterfly valve rises. The butterfly moves to maintain the pressure constant, and this can be accomplished only at the expense of a rise in pressure on the producer tops. This is accommodated by means of a second controller which, actuated by producer top pressure, controls butterfly valves in air intake mains. Therefore, when the producer top pressure rises, the butterfly valves in the inlet to the producers close up restricting the intake air, and the pressures are maintained within safe limits.

This system has operated with every satisfaction, and the problem is not now quite so acute. This is because a third battery of ovens has been installed, and so the duties of the controllers are no longer to reduce the producer gas flow to a half, but only to two-thirds.

Exhauster Control (*Fig. 2*).—Exhauster control by hydraulic means has been carried out in many cases, but recently an attempt has been made to solve the problem by pneumatic means. The application is typical of the general case in which

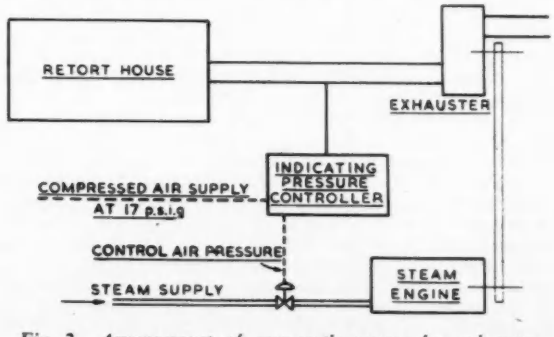


Fig. 2. Arrangement of pneumatic means for exhauster control.

* Hales & Moss. *J.Sci.Inst. 12.* No. 10. Oct. 1935.

an exhauster is driven by a steam engine, the vacuum at the inlet to the exhauster being measured by a pressure indicator. The indicator actuates a pneumatic controller, and a pneumatic signal from the controller operates a valve controlling the admission of steam to the engine.

The measuring instrument detects changes in the vacuum, and the controller then resets the steam valve, readjusting the engine and exhauster speeds to restore the vacuum. Although the number of stages in the process leads to some time lag, the controller is able successfully to overcome this, and control within ±0.1 in. w.g. has been obtained. It has been found practically that, to prevent 'hunting' in this installation, a fairly insensitive setting must be employed. The effect is such that, should the pressure indicator move full-scale, the valve would move through only about half its travel. This condition leads to satisfactory operation, but it is found that, while good control is obtained, control is not always at the desired value. To eliminate this off-set effect, it has been necessary to use a second control function, the integrating effect of which has been capable of restoring the control pressure to its desired value under all conditions.

Constant Pressure and Volume Governors (Fig. 3).—Pneumatic controllers of the types already considered could provide solutions to many distribution problems. Where pressure control only is required, the introduction of a simple pressure indicator, used to operate a controller, provides the necessary signal. This signal can be fed to the butterfly valve which, operated either by diaphragm heads or power cylinders, can be made satisfactorily in any size up to 54 in. diameter. Very close control can be obtained, and the apparatus is small and compact and can readily be housed in existing buildings.

If constant volume governing is desired, the butterfly valve and controller remain unchanged. The detecting element must, however, be a flow meter, and a convenient design is that which operates from an orifice plate. Orifice plates can easily be installed for control purposes, since many of the requirements for accurate measurement no longer have to be rigorously met. Any orifice plate will give a differential pressure, which varies as the square of the flow rate through it, and only if accurate measurement is required do the standard 20 diameters of straight pipe have to be adhered to. In such an application, even if the recorder did not necessarily read true flow within 10% the setting pointer could be adjusted by practical experience, so that the desired load could be obtained. A further factor is that the total pressure loss across the orifice need be no greater than the pressure loss when measurement only is desired.

The results of experience, gained from an installation in which constant volume governing is used to actuate an 8-in. butterfly valve, are available, and after suitable adjustment very close control has been obtained. The set point can be altered throughout the range and the response is immediate, control being within fine limits.

Time cycle control can be applied to such apparatus by the use of standard equipment. This might well prove of value in cases where it is desired to alter the controlled flow or pressure, to meet differing demands throughout the day, or even the week. The apparatus is merely a cam, which, rotated by a clock, alters the position of the set pointer at various periods during the desired time interval.

Calorific Value Control.—In the design of a scheme for automatically controlling calorific value, the speed with which measurement can be obtained is of paramount importance. Three installations have been tested in the South Eastern Gas Board under differing works conditions, and, depending on the installation, results of varying quality were obtained The use of a pneumatic controller will ensure that over a period of hours the average calorific value will correspond with that desired within very narrow limits, however large short-term fluctuations might be. It is felt, therefore, that short-term fluctuations of ±4% are of no real disadvantage, but for this example, a case has been chosen which demonstrates the efficiency which may be obtained from such a system under good conditions. At the plant concerned, diluent gas from a water gas plant was passed through its own wet purification system. This clean gas was then added to the purified coal gas and the mixture was passed through the works boosters. It is obvious, therefore, that under these conditions, it was possible to feed the mixed gas, the booster providing an adequate mixer, direct to a calorimeter. The calorimeter was coupled to a pneumatic controller similar to those already described, and the output from this controller was used to actuate a butterfly valve installed in the diluent gas stream. The butterfly valve was installed in a length of 18-in. main and in addition to the diaphragm head a valve positioner was employed. The valve itself was located in the open, and the use of the positioner ensured satisfactory operation with no inaccuracies due to friction.

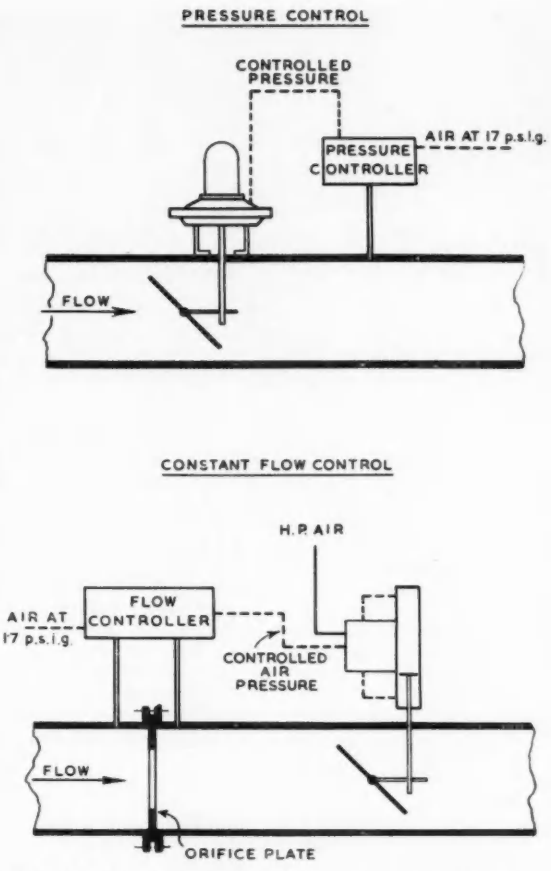


Fig. 3. Arrangement for constant pressure and constant volume governing.

The diluent gas could be either producer gas, blue water gas, or carburetted water gas of calorific value up to about 400 B.Th.U. per cu.ft. It was found in practice, that, in the installation considered, where time lags had been reduced to a minimum, adequate performance could be obtained if the controller was set up so that the maximum possible sensitivity was applied when producer gas was the diluent. Any change to carburetted water gas, while it involved a control line whose quality was not as high as that obtained on producer gas, still led to a condition where control was quite adequate and fluctuations of ±1.00% were the maximum encountered.

Such control schemes, while of value to normal gasmaking plants, will perhaps find their greatest use in schemes where gases of very high calorific value are being used for enrichment, since under these conditions very careful operation of the diluent rates must be ensured, if the mixed gas calorific value has to be maintained constant within reasonable limits.

Transmission systems can be actuated by any measurable variable, but in the gas industry their chief use is in connection with the requirements of distribution departments. Most frequently, flow and pressure are the quantities which have to be transmitted, and since the normal method of measuring flow is by differential pressure devices, the transmission of flow readings includes the case of pressure transmission.

In many cases readings must be transmitted a considerable distance and the normal practice is an electrical system using

telephone lines. The difficulties normally encountered are those caused by changes in electrical supply voltage, line resistance, or A.C. frequency. Many electrical systems are available, but it is felt that a system which overcomes the effect of these variables is particularly useful. One such system operates by converting the measured variable into an electrical pulse, the duration of which is proportional to the magnitude of the variable, but the magnitude is unimportant within wide limits. With such a system multi-signals can be successfully transmitted along one pair of lines only.

Instrument Maintenance

Instruments used for controlling purposes are generally reasonably well maintained, particularly if the control application is of primary importance. Indicating and recording instruments, however, can frequently go wrong without attracting any immediate attention, and in many cases may give progressively more and more erroneous readings over periods of months until they finally break down altogether. When it is realised that the results given by these instruments are used for control, for costing, or even for design purposes, it becomes obvious that such a state of affairs can be gravely misleading and cause serious error.

To function correctly, all process instruments require adequate maintenance. The problem of adequate maintenance in gas boards is made difficult, since, in general, large numbers of small works have to be considered, the works frequently being widely dispersed. Many of the works are too small to require large numbers of instruments and therefore provision of a fully trained instrument man at such a works is uneconomic. Geographical separation makes the alternative solution, of a team of instrument technicians available at some central headquarters and ready at short notice to give attention in any part of the area, equally impracticable.

In the South Eastern Gas Board, a solution is being attempted based on 'preventive maintenance.' It is felt that, if the majority of the work done on instruments can be carried out at the discretion of the staff, and not purely as a result of breakdowns, then a team of instrument mechanics of reasonable size will be adequate. A system has, therefore, been designed on the preventive basis; mechanics are being trained to look after single works or groups of works which are geographically conveniently situated. Their duties will for the most part consist of routine daily and weekly checks and inspection of running instruments; full-scale overhauls will be carried out to a pre-determined programme by skilled mechanics from the central organization. It is felt that by this means it should be possible to reduce to manageable proportions the number of visits made necessary through breakdown.

The semi-skilled duties to be carried out by the mechanics on site are being reduced to a routine, which will be completely described in brochures supplied by the central organization. This will not only introduce standardization of maintenance methods, but will also simplify the problems of 'fault finding.' If an instrument which is suspected of giving incorrect readings is tested by the site man in accordance with a carefully designed routine, and if the results of these tests are communicated to the central organization, it will, it is hoped, in many cases be possible to diagnose the cause of failure and supply the necessary spare components.

To indicate the type of duties envisaged as a routine, it is proposed to examine in detail the case of a ring balance flow meter. The programme for such an instrument would be as follows:—

Daily.—Chart changed; pen filled; zero checked; Works Staff.

Weekly.—Impulse lines cleared; Works Staff.

Monthly.—Leak test; window cleaned; Works Staff.

Annually.—Overhaul and calibrate; clean case internally; Central Instrument Staff.

3 Yearly.—Paint line and stand including case; Works Staff.

15 Yearly.—Renew lines; Works Fitters.

A measure of standardization of instrument ranges can considerably simplify the task of a maintenance department. If on any one works six instruments of the same range are employed it is obvious that one spare instrument can be used for exchange purposes with any one of the six.

Complete overhauls will be undertaken in three ways:—

1. It will be the responsibility of the site man to arrange to send back to the central organization any instruments on plants shut down for repair.
2. If a plant cannot be shut down, it will be possible for the central organization to lend to the works in question a spare instrument.
3. It is possible in cases of emergency for the central organization to supply a skilled man for a period of perhaps a week to overhaul on site a number of instruments which cannot be released by either of the preceding methods.

The institution of this system has only recently begun, but it is hoped that over the next few years results should be available and the efficiency of the system established.

HUMAN RELATIONS—(*concluded from p. 42*)

schemes at once could price itself out of existence in a very short time. The hazards would all be removed, but the work and the prosperity might be removed as well. It must be accepted that there is a moral duty, but it must also be accepted that the extent to which plans can be implemented has to be influenced by material considerations and that influence must often be decisive.

How Can the Correct Middle Course be Achieved?

After such a catalogue of pros and cons, conditional clauses and expedient compromises, it would not be surprising to receive the charge of nebulous musing. The implementation of these ideals is not easy. There can be no code of practice rigidly laid down. While there must be a clear statement of policy on the subject of human relations, it has to be a flexible policy which is unlike anything familiar in the fields of engineering and accountancy, but which may have some tenuous parallel in the consumer service organization, where also it is, in the end, the people who matter. There is one underlying belief which must be firmly held—it is possible to learn to handle men. Some individuals have a greater natural facility for the task but, as in many other fields of knowledge, only constant application and attention can ensure full development of any natural gifts. Having accepted that, the corollary is that higher management must select people for junior managerial posts who will and can work to a policy of human relations as applied to an industrial society and that such a policy must exist. The one-sided brilliant scientist or the impersonal master strategist has his place in the back room and not in handling men unless he is prepared to give thought to this pre-eminent speciality. There is a place for special courses in the detailed points of man-management and there is a strong case for applying powerful employment sanctions against the man who cannot, or will not, learn. It is a compound of personal character, deliberate application and experience, and the realization of the need to work at the subject is the first step towards the desired object.

There are very grave difficulties in the path. There is no point in saying that the differences should not exist; there is a lot of point in saying that they must be overcome. There are grievances with their origin in history, but with a powerful continued existence. There is often an atmosphere of deep suspicion between employer and employee. Lofty condescension will meet many deserved rebuffs; charity is not sought and is too often suspected. Even the genuine approach with real sincerity will prove disappointing very often. Disraeli once said that England had become two nations, and often the difficulties must seem as great as that. Constantly applied sincerity of purpose alone will exorcise the evil spirits of the past. No employer or employee can ask for more.

IRON AND STEEL SCRAP PRICES.—The Minister of Supply has made an Order (S.I. 1953, 1954) removing price control of wrought iron scrap and restricting price control of all other iron and steel scrap to material sold to or bought by consumers. The maximum prices of the better classes of iron and steel scrap have been increased by amounts varying from 2s. 6d. to 30s. ton to encourage the proper sorting and preparation of scrap by producers and merchants. The saving of scrap resulting should be significant.

Quality tells...

...the Seymour sells

The supreme finish, distinctive appearance and the high quality of the Flavel-Seymour make it a certain seller. Supplied in a wide variety of high-quality vitreous enamels and fitted with a built-in gas burner.

★ **Approved by the Ministry of Fuel and Power**

The **FLAVEL-SEYMOUR**

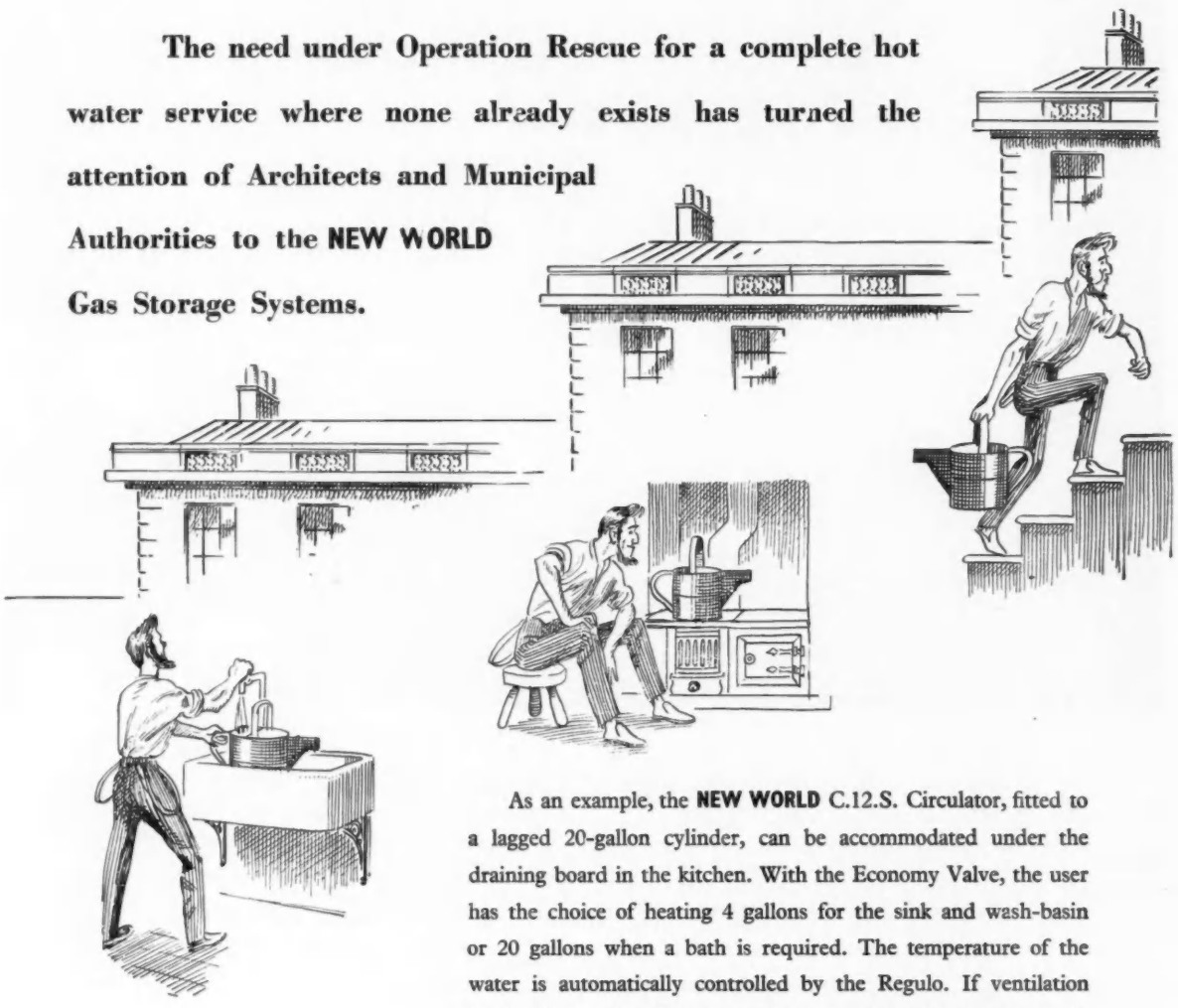
The Aristocrat of them all!

Telephone: Leamington 100 (Head Office) 3091/2 (Sales) Telegrams: FLAVELS

FLAVELS of LEAMINGTON *Makers of fine cooking and heating appliances since 1777*

NEW WORLD TO THE RESCUE

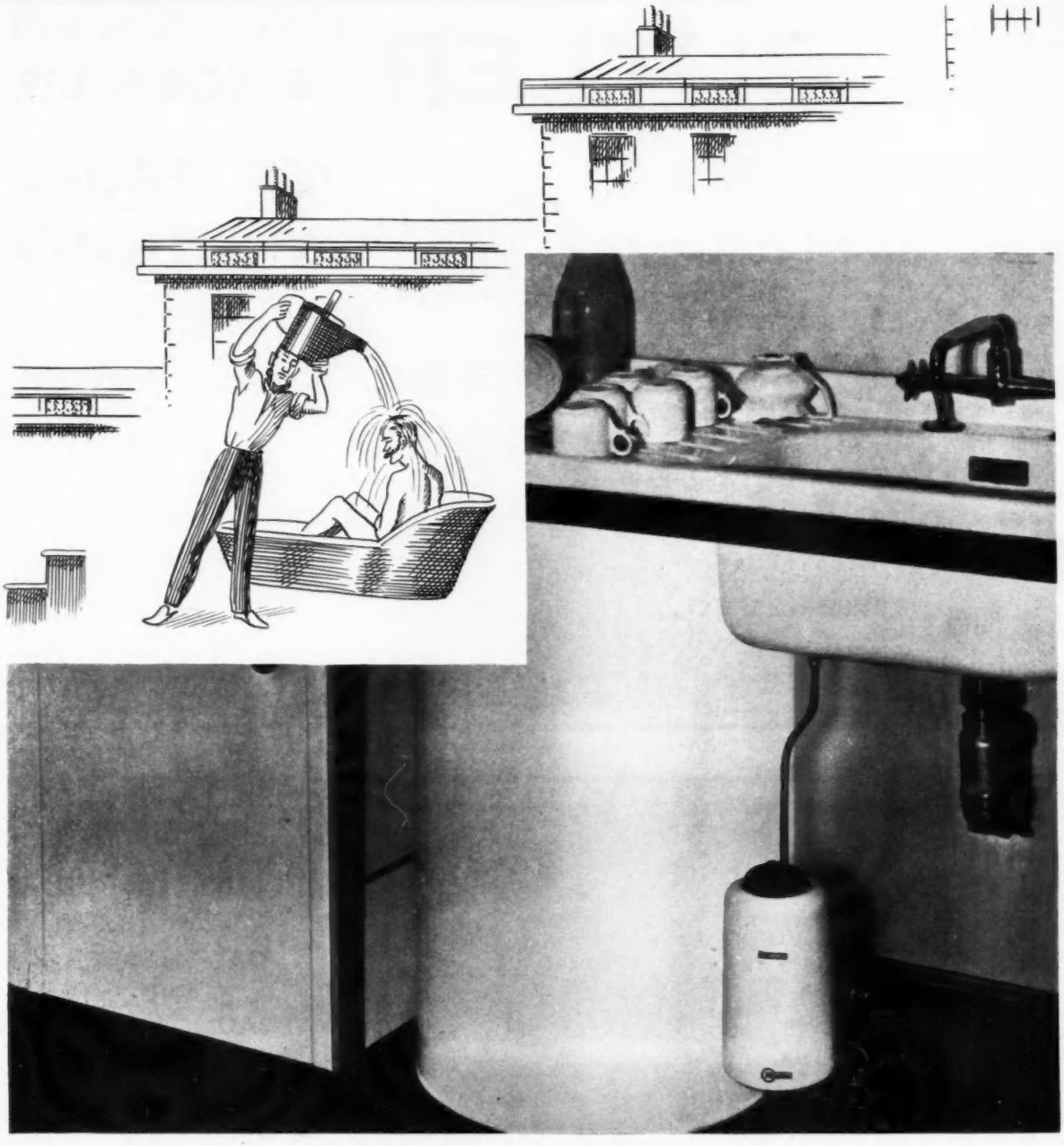
The need under Operation Rescue for a complete hot water service where none already exists has turned the attention of Architects and Municipal Authorities to the NEW WORLD Gas Storage Systems.



As an example, the **NEW WORLD** C.12.S. Circulator, fitted to a lagged 20-gallon cylinder, can be accommodated under the draining board in the kitchen. With the Economy Valve, the user has the choice of heating 4 gallons for the sink and wash-basin or 20 gallons when a bath is required. The temperature of the water is automatically controlled by the Regulo. If ventilation in the kitchen is adequate no flue is needed. This installation is being extensively used in new houses and flats, and for the modernising and conversion of old property.

A similar type of installation is available for use in an airing cupboard; and when the house contains no ball valve cistern, a combination unit complete with cistern mounted on the cylinder can be supplied.

Further information from **RADIATION GROUP SALES LTD., 7 STRATFORD PLACE, LONDON, W.1.** *Phone: MAYfair 6462*



NEW WORLD Storage Water Heaters are reasonably priced, easily fitted, economical to use, provide hot water at the same temperature, Summer and Winter, can normally be operated on the existing Gas and Water Services and require an absolute minimum of maintenance.

recommend NEW WORLD PRODUCT OF Radiation Ltd *storage water heaters*

SAMʟ CUTLER & SONS LTD

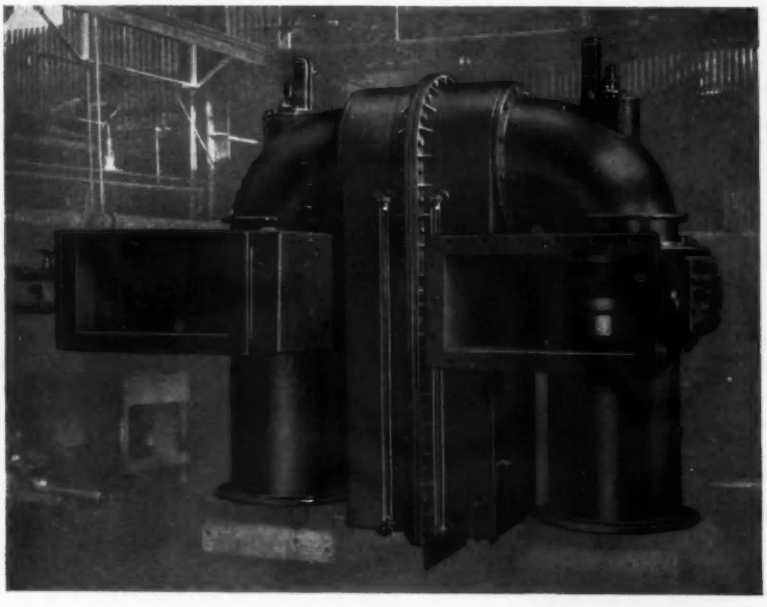
GASHOLDERS
PURIFIERS
CONDENSERS

STEEL TANKS
GAS MAINS
HANDLING PLANT

GENERAL STEEL CONSTRUCTIONAL WORK

70, VICTORIA STREET,
WESTMINSTER,
LONDON, S.W.I.

PROVIDENCE IRON WORKS,
MILLWALL,
LONDON, E.14.



COMBINED
Milbourne Disc Valve
WITH
GAS HEATER
AND
HYDRAULIC SEAL VALVE
AS ADOPTED FOR ONE OF THE
Largest Cast Iron
PURIFIER
INSTALLATIONS
IN THIS COUNTRY

C. & W. WALKER, LTD.

DONNINGTON Nr. WELLINGTON—SHROPSHIRE
'Phone : 12 WELLINGTON-SHROPS. 'Grams : "FORTRESS," DONNINGTON—SHROPSHIRE.
'Phone : 5842 LONDON—VICTORIA.
LONDON OFFICE : 70, VICTORIA STREET, S.W.I.

3

Repairing a Bench of Continuous Vertical Retorts*

By H. KETTLEWELL, ASSOC.M.INST.GAS E.†

DURING the summer of 1952 the availability of base load coal gas plant at Nottingham was in excess of the anticipated gas demand for a period of three months due to the putting to work of a new installation of continuous vertical retorts eighteen months previously, and it was necessary in the gas production schedule to assess the relative economies of different methods of reducing output from the plant, having regard to the condition and age of the plant. The alternatives considered were reduced coal throughput and reduced steaming, standing a proportion of the plant under slow fire, and shutting down cold a section of the plant.

The coal gas plant consisted of four benches each of 12 retorts and two benches each of 16 retorts, giving a total effective daily capacity of 9.6 mill. cu.ft. per day with a nominal daily coal throughput of 1.07 tons per retort per 10 in. major axis. The quantity of gas actually required was approximately 8.2 mill. cu.ft. per day and, in order to accommodate the reduction in gas output, the coal throughput on all retorts would need to be reduced to 0.9 tons per retort per day per 10 in. major axis.

It was considered that the running of the retorts on such a low throughput would be uneconomical, due to the following points: Coke consumption would not be less than working the retorts at nominal throughput and standing a bench under low heats, it might be greater; labour would not be reduced because it would not be possible to reduce the number of working producers; and it would be very difficult to maintain a C.V. of 480 B.Th.U. using Notts and Derby coals at a throughput 16% less than normal owing to the varying ages of the retort benches.

The standing of a proportion of the plant under slow fire to reduce the daily make by 1.3 mill. cu.ft. would mean that a bench of twelve 76 in. retorts would be out of production. The minimum coke consumption to keep this bench at a low safe temperature was found to be 3.5 tons per day, and the cost would be £1.588.

The scheduled repair programme included resetting a bench of 12 retorts in 1953; consideration was given to doing this in 1952. The condition of this bench was such that this could not be justified, and it was accordingly decided to shut down cold a bench of 12 retorts for a three month period and carry out a complete inspection of the retorts and any minor repairs which were required. The cost of reheating this bench was £659.

Repairs to the Bench

On July 23, 33 days after sealing the dampers, the retorts were opened for inspection and were found to be quite cool. The condition of the retorts generally followed a pattern. The end walls of the retorts were cracked in the centre for approximately half the retort, the width of the cracks averaging $\frac{1}{8}$ in., and appearing to have split the end blocks. These cracks were generally in the lower half of the retort covering part of the lower firebrick and the lower silica blocks. The upper half of the end walls was good, but the corner joints, either one or both, had opened up. The outer end wall of No. 20 retort was cracked for the full depth of the retort. The corner joints were tight, while the inner end wall showed no cracks except where one of the corners had opened up from half-way to the top. Through the whole of the top firebrick this opening was about 0.7 in. wide, indicating movement both longitudinal and horizontal. The corner joints on at least half of the retorts were opened up and it would seem that the side walls had tended to move towards the vertical position.

It was decided to use neat S.P. cement for pointing up the cracks and open joints, using firebrick or silica chippings wedged into the wet cement, finally washing over the cement before setting with S.P. cement slurry. After the bench had been brought up to working temperatures all the joints held without crushing up to the time the bench was let down for repair in 1953. The repair took 19 days with bricksetters 576½ man-hours and labourers 396.

No. 24 retort deserves special mention, as although apparently this was much the same as the other retorts, when the repairer was brushing and washing the loose material from the retort joints, a large piece of brick panel came away about 4 ft. above the lower sliding joint, disclosing the combustion chamber, which was the farthest chamber from the front wall. The worst erosion generally takes place around the inner combustion chamber, which is the hottest part of the retort flues, also round the vertical joints, but rarely on the horizontal joints. One of the holes was about 5 in. long and 1 in. wide with a smaller hole above of a similar shape. Behind these two holes the brickwork had broken away leaving the rims of the holes more or less knife edged. This feature is not unusual when holes appear, but is nevertheless somewhat disconcerting when attempting to carry out a repair as there is no key for the cement. This retort must have worked under pressure from time to time because on further investigation it was seen that the back wall of the combustion chamber was burned out and the hole had gone through into the secondary air chamber.

To repair these holes it was decided to fill the combustion chamber solid by cutting a silica block to fit at the bottom of the flue on the nostril tile level. Wet silica clay was then dropped in and after this the whole flue was filled with silica clay, by inserting a 2 in. diameter tube fitted with a funnel through the open space corresponding to the normal sight box position. From the inside of the retort the clay was prevented from running through the holes in the retort by pressing in and plugging up the holes with stiff grout and wedging in pieces of silica brick, finally parging the whole area with S.P. cement grout. The putting out of commission of one combustion chamber did not appear to affect noticeably the temperature of the retort.

The joints in the top firebrick were raked and pointed, particularly the top two courses and the split course immediately under the seating castings. The bottom firebrick was also raked and pointed, paying particular attention to vertical joints.

The nostril tile zone was a troublesome spot, particularly the far end CO nostril tile at the base of the fourth combustion chamber. Of the 24 inner nostril tiles three were completely blocked and 10 had rough tile runners due to fused flue dust which caused the tiles to sit unevenly, allowing producer gas to escape round the outside edges. The rough fused dust was chipped off and new nostril tiles were cut to shape to make a good fit.

Damper boxes may be considered a detail, but a very important one as the CO damper boxes and lids should fit tightly. The CO and waste gas damper boxes and lids were examined and made good by grinding where necessary, and the usual bricks were replaced behind the lids to shield them from excessive heat.

While the work was in progress the retort bottom ironwork had been examined; in all 12 retorts the top iron-to-iron joint required remaking with Nigol clay and asbestos string. It is important to make these joints when the bench is cold because it is only possible to make a satisfactory job from the inside of the coke chamber.

Spalling varied in each retort; in some it was as much as 1½ in. deep, in others it was as little as ½ in. deep. These retort faces were washed with brush and water to remove any loose flakes of dust and brick and a thick wash of S.P. cement was put on. During the rest of their working life the areas gave no trouble. It was found that most of the welds were still intact, although some patches of weld were loose but still keyed to the rough surface of the retorts. Very few had been dislodged during cooling.

The welds which were good were left on and those which were loose were removed and the holes pointed up. The

* From a paper presented recently to the Midland Junior Gas Association, in Birmingham.

† Carbonizing Superintendent, Nottingham Undertaking, East Midlands Gas Boards.

difficulty about doing this was that the holes in the retort faces had widened again as they went deeper into the brickwork towards the flues which caused difficulty in filling the hole firmly. After filling the holes, the whole area was washed with S.P. cement slurry and the old welds and the patched up holes remained tight until the bench went down for repair in 1954. On the average the welds were about six to twelve months old and some of them had not been touched since they were first put on. All our welding operators are bricksetters and it takes three to four months to train a fresh man. To keep all 80 retorts in order there are three bricksetters available, and a foreman bricksetter who assists occasionally with the two welding units which are generally in use at the same time.

From observations made it was evident that the retorts farthest away from the producer gas main were in a worse condition than the retorts nearest to the producer gas main, and this peculiarity was noticed on various benches with which the author has been associated. After this bench had been lit up it was noticeable that the only leaks in the retorts were on the lower sliding joint and most of these were in the retorts farthest from the CO main. The cause might be due to the more drastic treatment this half of the bench receives in order to drive the heat across to the non-producer side retorts.

Towards the end of the repair, the producer gas bus main and the common CO main were cleaned out. It was found that at one point in the CO main a high ridge of flue dust had collected between the cleaning points which would probably have restricted the even flow of hot gases passing into the setting during the warming up period. When the producers were examined the side and centre plates were in good condition and not seriously burned after 4½ years continuous work. The water boxes, which were old when the bench was put to work, were still in a repairable condition and a ¾ in. iron bar was fitted through the trough of each box and made rigid by lock nuts at either end in order to prevent the water boxes from falling out if they broke across the middle during the warming up period. Another slight alteration was to protect the door frames where trouble had been experienced with the flanged corners of the frames cracking across diagonally. The weakened frame was gradually forced out by corrosion caused by moisture getting down between the door frame and the side and centre posts.

The pressure exerted eventually cracked the frame across the middle and the door would not fit correctly to make a seal. When these door frames were renewed a length of angle iron 3 in. by 3 in. by ¼ in. was fastened along the whole length of the frames by the existing bolts to equalize the strain across the whole of the bottom of the frames, and up to now it has prevented any further trouble.

Warming Up and Lighting Up

It is laid down in the plant designer's 'Operators' Handbook' that there is a maximum rate at which the temperature of a setting should be increased, particularly when new brickwork has been used. When warming up a setting after a point and wash, the temperature can be brought up at a faster rate by daily rises of 10°C. up to 100°C and thereafter at 20°C. per day. Approximately 70% of the expansion takes place within the range of 15°C. to 400°C. Care of the retort front walls is most important and they must not be allowed to crack or show open joints without immediate attention.

The difficulty of this particular design is the travel of the hot waste gases into the bus main and down into the CO main, then down again through the front walls to the bottom cross under flues which convey the hot gases to the far side retorts. The position of the cross under flues is only 2 ft. 6 in. above the floor joists and they are on the same level as the bottom of the producer hearths, which means that the waste gases have to be forced from the top of the producers down to the same level as the producer hearths.

Drying fires were put in one corner of each producer on August 14 while the erectors were still pointing the top joints in the bottom ironwork from the inside above the extractors and replacing the oval manhole covers. The seal discharge doors were loosened and cleaned, filled with water and shut. All covers were placed on the tops of the retorts and all plugs were left out for ventilation purposes. All secondary air slides were loosened and shut.

The front CO dampers were fully opened along with the CO isolation dampers. The covers of the sight boxes at the tops of the four corner combustion chambers of each retort were opened in order to allow the waste gases to pass away and create a warm current through the combustion chambers. Suitably protected thermometers, range 0-360°C., were put into the waste-gas collecting flues.

After a few days the rodding hole plugs were put into position as the bulk of the moisture had evaporated. These plugs are a good guide for indicating when all the moisture has been driven out of the setting by the presence of condensed vapours on the plug ends. It is noticeable that the temperature rise is sluggish as long as these beads of water are showing on the plugs.

During the early days of warming up, the temperature of the gases and surrounding brickwork of the waste gas collecting flues of the retorts situated adjacent to the back wall of the producer block started to increase rapidly due to the heat from the producer fires coming through the back wall; the dampers were checked and ultimately closed completely to keep these temperatures within range of the rest of the retort temperatures. A graph of the temperature rise from the commencement to light up showed that difficulty was met in getting the non-producer side temperatures to increase at the same rate as the producer side retorts. As the producer fires were spread across the bottom of the producers and filled up the space to the bottom step plate, pressure became evident over the doors. The 9 in. × 6 in. holes were partially blocked to drive the warm gases into the CO main and eventually into the setting. The doors were kept open slightly to allow air to enter to ensure that no unburned producer gas left the producers. Water must be kept trickling over the step plates continually to prevent the fronts of the fires getting too hot and burning the producer ironwork. It is a difficult task to keep these temporary plates from bending or warping due to the excessive heat. When the fires are larger the steam generated from the water passing through the hot coke produces long flame conditions in the uptakes.

As the temperatures of the setting are increased, the volume of the fires must also be enlarged. The producers in this case were increased one step plate at a time and 31 days elapsed from the commencement of drying out until the fires were at a height of 10 plates. (These producers have 13 plates.) Gaseous firing was commenced on the 33rd day. The quantity of coke used was 124 tons 16 cwt. in 36 days.

The morning after lighting up, the lower silica zone was a dull red colour and by noon the heat had increased and small flames of producer gas were burning along the lower sliding joint on six of the retorts, five of which were on the non-producer side. As the retorts warmed up these leaks on the lower sliding joint closed up and no trace of them has been seen since. When the temperatures had increased to 1,200°-1,250°C. the repairs were examined and no sign of cracking or peeling was noticed, neither were there any leaks. The bench was allowed to soak for four days and on the fifth day the retorts were charged with coke and eight of the twelve were put to work as soon as possible. After all retorts were working it was found that the temperature of the waste gas main was 30°-40°C. lower than before the 'point and wash' and the average steam to retorts in the whole house increased by 2 lb. per sq.in.

DISCUSSION

Mr. H. J. Reynolds (President) congratulated Mr. Kettlewell on his paper which he considered would serve as a useful source of help to gasworks personnel when considering repairs and lighting-up of settings.

Mr. S. Brockbank (Newcastle-under-Lyme) wondered whether the best solution had been found, as he felt that the question of reduced throughputs in the existing plant had been rather passed over. He thought that with a gas produced at 450 C.V. this would probably have been a more economical proposition. With regard to the filling up of the flue and the putting out of commission of one combustion chamber he questioned whether it might not have been better to replace the panel.

Mr. Kettlewell replied that reduced throughputs would have reduced the thermal yield, and it had to be borne in mind that during holidays or periods of low demand, it would have been necessary to shut down some of the retorts, and this would have affected the maintenance of a C.V. of 480 B.Th.U.

Unfortunately no panels had been available at the time of the repair so a replacement was not possible in the time at their disposal.

Mr. A. Garthwaite (Nottingham) pointed out that if the hole had appeared at the other end of the retort, it would not have been possible to fill up the flue because it would have been impossible to get at the back tiles.

Mr. Kettlewell replied that such erosion normally took place round about the spalling area, and in the inner combustion chamber so that such an eventuality as Mr. Garthwaite had mentioned was not likely to occur.

Mr. Brockbank wondered how the nostril tiles could be cleaned without knocking a hole through the walls.

Mr. Kettlewell said that the three nostril tiles which were blocked were not cleaned. The only way would have been to take the retort front panel out altogether which would have been out of the question in the time available.

Mr. W. E. Dobson enquired what the condition of the S.P. cement was like when the retorts were shut down later. He thought the cost of labour for cleaning fires was rather on the high side. He also questioned the value of the 30° temperature drop in the waste gas main, as he intimated that it was usual to get quite considerable variations in these temperatures. Another point on which he differed from Mr. Kettlewell was the assumption of 60% efficiency for steaming. In practice he had found that even a figure of 50% was difficult to maintain. He asked whether any of these assumptions were supported by gas analyses.

Mr. Kettlewell answered that the labour charges for cleaning the fires were quite authentic as far as his particular undertaking was concerned. The S.P. cement had been examined as the retorts were pulled down and had been found to be in very good condition. No welding had been necessary on those particular retorts during the nine months of operation after the repair. He indicated that the figures for the 30° drop in waste gas temperature had been arrived at over long periods and were not the result of short spot checks. He agreed that steaming efficiency was difficult to assess but he maintained that the 2 lb. was the average increase in pressure for the four benches. He mentioned that there had been an increased yield of 3½ therms per ton on comparison with the results before the repair and as some of this might have been attributable to a 5% allocation of Yorkshire coal he had assumed half a therm as arising out of the improved efficiency of the retorts repaired.

Mr. A. W. Sanders (Leicester), asked what method had been adopted to clean the tiles to enable them to fit more effectively. In the warming up it was stated that approximately 70% of the expansion took place within the range of 15° and 400°, whereas he believed this to be probably more like 275°. He was surprised to see the length of time taken on lighting-up and wondered whether there was any reason for this. With regard to the statement concerning the increase in temperature of the retorts he enquired why the volume of the fire was given more importance than the volume of heat pushed forward.

Mr. Kettlewell said the cleaning of the nostril tiles was accomplished by long chisel bars with carbon tips. It had not been possible to make a perfect job, but the tile was then cut to fit as evenly as possible. With regard to the delay in lighting-up, this was due to the difficulty in getting the gas across to the farther side of the bench from the C.O. main. It was necessary to have an excessive amount of heat to push the gas over due to the peculiar layout of that particular setting.

Mr. A. Griffiths (Dudley) enquired whether the subsequent shutting down and repair of the bench was carried out according to a rigid programme in view of the fact that the retorts were working so satisfactorily. He was interested to know the reasons for the damage to the producer door frames, and wondered whether this might not have been caused by excessive heat.

Mr. Kettlewell agreed that it had seemed a pity to shut down the bench again so early but it had been deemed necessary in order to fit in with the overall repair programme. He had to admit that the steaming figures were only an estimation and he had no direct proof of the saving, but taking into account all the facts he felt justified in attributing the extra 2 lb. gained on the whole house to the better condition of the repaired bench. On the subject of the door frames he said that the coke from Notts. and Derby coal did not give an excessive heat; on inspection quite an amount of rust and corrosion had been discovered behind the frame which quite obviously was due to moisture.

Mr. J. Foxton (Cheltenham) expressed his disappointment that the paper had not included gas analyses before and after the repair. He suggested that quite a number of the cracks mentioned could have developed during the shutting down process.

Mr. Kettlewell agreed that some of the cracks were no doubt due to the letting down, although at least two of the joints had opened up previously; he had, however, only mentioned the cracks in order to show how they had been sealed up again.

Mr. N. Calvert (Nottingham), supporting Mr. Kettlewell, stated that shortage of chemical staff had prevented gas analyses being carried out, great difficulty being experienced in the recruitment of staff for this purpose. On the question of steaming efficiency, although he agreed the figure of 60% was a little high, even if this was reduced to 50% it would make no appreciable difference to the increase in therms.

Mr. S. C. Porter (Birmingham) emphasized the unreliability of using waste gas temperatures owing to the considerable variation. With respect to the saving of one therm per ton he maintained that a tighter setting should give at least the improvement mentioned if it had been repaired properly.

Mr. N. G. Earle (Redditch) remarked that the author apparently subscribed to the view that therms per ton showed the efficiency of the retorts, he himself was rather inclined to the opinion that while therms per ton may show the economic utilization of gas works plant, a better indication of the efficiency of the retorts was given by the F.E.I. figure.

Mr. Calvert pointed out that after the repair had been carried out the water gas plant had been running continuously, any extra gas therms made in the retort house meant less water gas, which in turn improved the F.E.I., which incidentally was particularly good in the Nottingham Undertaking.

Mr. S. C. Crathorn, proposed and Mr. A. Griffiths seconded a vote of thanks to the author.

GALLANTRY REWARDED

'This is only a token of our admiration for your great gallantry in trying to save your comrades.' With these words the Chairman of the South Eastern Gas Board (Mr. W. K. Hutchison) presented a wallet with a gift of money to Mr. Charles Jack (49), of Windsor Road, Thornton Heath, at Croydon on Christmas Eve.

Mr. Jack, who is an engine fitter at Waddon Works, had attempted with Mr. E. J. Best, another of the Board's employees, to save Mr. T. A. McGee, a contractors' foreman,

Mr. W. K. Hitchison (right) makes the presentation to Mr. Charles Jack.

from a gas-filled coke hopper at Waddon Works in November. They were unsuccessful, and Mr. Best lost his own life in the rescue attempt.

At the inquest on the two men the Coroner told Mr. Jack: 'You made a very valiant attempt to save these two men's lives.' A personal gift of money from the Board has been sent to Mrs. H. I. Best, 34, Cosedge Crescent, Croydon, widow of Mr. Best.

Growing Output of Sulphate of Ammonia

The 57th year of propaganda work undertaken successively by the Sulphate of Ammonia Committee, the Association, the Federation, Nitram, Ltd., and Imperial Chemical Industries, Ltd., is reviewed in the 34th annual report of the British Sulphate of Ammonia Federation just published. Total deliveries of sulphate of ammonia by the Federation in home and export markets, which in the previous year for the first time exceeded 1 mill. tons, showed a further rise from 1,015,400 tons to 1,047,000 tons.

The figures in Table 1, expressed in thousands of metric tons of pure nitrogen for 'Fertilizer Years' ended June 30, have been compiled from the published information available regarding production and consumption of nitrogen.

The upward trend in world nitrogen production and consumption continued during 1953-54. Compared with the previous year, total production rose by about 11% and total consumption by 13.2%. The increase for agricultural use was 11.5% and for industrial use nearly 22.2%.

The total United Kingdom production of nitrogen products in the calendar year 1953 was 5.9% higher than in 1952. Output of fertilizer products increased by 3.6% and production for industrial uses by 11.9%.

The quantities in the first five tonnage columns of Table 2 show the total production of nitrogen products expressed in terms of a standard material containing 25% ammonia = 20.6% nitrogen. The last column shows tons of sulphate of ammonia actually produced with a nitrogen content varying from 20.4% to 21.1% N.

The figures in Table 3 are based on nitrogen producers' deliveries against sales within the fertilizer year and for 1953-54 show an increase of more than 11,000 tons nitrogen over 1952-53. This is a record tonnage and consumption is believed to have approximated closely to deliveries as no substantial change is known to have taken place in end-of-season stocks. The tonnage of nitrogen sold in compound fertilizers was much greater than in any previous season.

Fertilizer prices were freed from statutory control on July 1, 1953. A new scale of early delivery and compounding rebates for sulphate of ammonia was introduced on that date and the results for the season appear to have justified the changes made. It was necessary to increase the price of sulphate of ammonia by 4s. per ton on March 1, 1954, to cover increased transport costs. Subsidy arrangements were the same in 1953-54 as they were in 1952-53.

Gradual removal of controls and restrictions raised a number of marketing problems, and emphasis shifted in some cases from quantity to quality as the main consideration in planning output for sale. Costs of production had to be re-examined to discover means of maintaining profit margins in a free market with increasing competition from traditional food importers. The rôle of fertilizers in increasing yields per acre, reducing unit costs and improving efficiency in these conditions, is becoming more widely recognized.

Agricultural development work by Imperial Chemical Industries, Ltd., in 1953-54 covered a wide field. The main emphasis was on grassland where the substantial volume of information already accumulated was further increased and made available to farmers. Extensive trials have been carried out on the

TABLE 1.—World Production and Consumption of Fixed Nitrogen for all purposes
Thousands of metric tons : 1 metric ton = 0.9842 long ton
DETAILS BY COUNTRY

	1953/54		1952/53		1951/52	
	Production	Consumption	Production	Consumption	Production	Consumption
EUROPE (*a*)	3,629.0	3,176.1	3,279.5	2,806.0	3,058.0	2,595.5
Belgium/Luxemburg	214.7	104.6	181.7	93.6	230.0	89.7
France	329.3	341.1	311.9	305.1	295.2	282.5
Germany—W. Zones	762.7	577.3	718.6	490.9	613.2	423.6
Netherlands	262.6	173.5	247.4	161.2	230.9	158.9
Norway	192.0	38.2	170.3	40.3	172.3	36.8
Italy	310.0	235.0	246.0	201.3	215.0	180.3
U.K.	451.3	344.7	431.7	310.9	413.1	303.4
Other Europe (*a*)	1,106.4	1,361.7	971.9	1,202.7	888.3	1,120.3
ASIA (*b*)	753.8	1,008.3	671.0	964.8	521.7	744.4
China and Formosa	32.1	154.3	31.3	152.0	22.5	113.3
India and Pakistan	67.2	115.7	65.1	108.9	24.9	81.0
Ceylon	—	17.4	—	15.1	—	14.3
Japan proper	644.6	529.1	572.0	505.9	471.7	436.9
Other Asia (*b*)	9.9	191.8	2.6	182.9	2.6	98.9
AFRICA	44.4	191.1	37.3	170.6	27.5	166.2
Egypt	20.1	111.9	18.7	107.3	9.3	94.5
Other Africa	24.3	79.2	18.6	63.3	18.2	71.7
OCEANIA	19.6	32.5	18.0	22.3	15.9	26.7
AMERICA	2,414.3	2,444.6	2,180.7	2,089.0	1,891.9	1,844.6
U.S.A. (*c*)	1,971.2	2,235.6	1,720.8	1,924.4	1,465.6	1,672.3
Canada	199.0	78.8	193.2	63.6	181.0	57.0
Chile	230.1	10.3	252.7	10.9	234.8	10.8
Br. West Indies	—	8.9	—	8.7	—	10.4
Other America	14.0	111.0	14.0	81.4	10.5	94.1
TOTAL WORLD	6,861.1	6,852.6	6,186.5	6,052.7	5,515.0	5,377.4

(*a*) Including Eastern Zone of Germany and U.S.S.R. (*b*) Including North Korea and Manchuria. (*c*) Including Hawaii and Puerto Rico.

TABLE 2.—Total Production of Nitrogen Products and Sulphate of Ammonia in United Kingdom
(Long tons of 2,240 lb.)

Calendar Year	England and Wales	Scotland	Northern Ireland	Total	Included in the Total	
					Industrial Ammonia Products	Sulphate of Ammonia as such
1939	783,400	72,400	1,000	856,800	263,900	483,300
1950	1,595,800	206,000	1,600	1,803,400	505,000	960,700
1951	1,679,800	224,800	1,700	1,906,300	601,500	968,100
1952	1,787,200	223,800	1,500	2,012,500	556,600	1,015,400
1953	1,887,100	242,400	1,400	2,130,900	622,900	1,047,000

TABLE 3.—Total Deliveries for Agricultural Consumption in the United Kingdom

Fertiliser Year	Sulphate of Ammonia Only (Long tons of 2,240 lb.)				All Nitrogen Fertilizers (Metric tons of 2,204.6 lb. Nitrogen Content in)		
	England, Wales and Channel Islands	Scotland	Northern Ireland	Total	Sulphate of Ammonia	Other Forms	Total Nitrogen
1923/24	79,600	41,000	7,400	128,000	26,800	7,600	34,400
1930/31	97,100	39,000	6,300	142,400	29,800	10,400	40,200
1938/39	134,300	38,800	6,700	179,800	37,600	23,000	60,600
1946/47	417,250	99,621	34,337	551,208	115,366	48,700	164,066
1947/48	483,863	109,953	39,100	632,916	132,467	52,943	185,410
1948/49	449,988	105,275	38,516	593,779	124,276	60,828	185,104
1949/50	564,372	136,015	47,728	748,115	156,577	69,083	225,660
1950/51	540,290	125,161	39,499	704,950	147,543	68,384	215,927
1951/52	415,947	103,455	28,205	547,607	114,612	67,382	181,994
1952/53	505,865	102,843	41,449	650,157	136,075	95,098	231,173
1953/54	560,131	113,309	43,993	717,433	150,156	92,397	242,553

manuring of cereals and further work is planned on the effect of nitrogen on the yield and quality of different cereal varieties. The new stiff-strawed wheats for milling and barleys for feeding have given very good results with heavy top-dressings of nitrogen. Many demonstrations organized in connection with both grassland and cereal developments have been sponsored or supported by the National Agricultural Advisory Service of the Ministry of Agriculture.

Press advertising has concentrated on the use of nitrogen for grassland and cereals at the appropriate times of the year. Literature ranging from very large editions of leaflets on specific subjects to monographs on the use of nitrogen on a whole-farm scale have been circulated to the agricultural trade and official bodies. Lectures were held throughout the winter of 1953-54 all over the country and there is much evidence of the interest of farmers in this form of propaganda. A feature of the spring and summer farm demonstrations in 1954 has been the high average attendance and there is no doubt that the lines of development now being pursued not only make impressive subjects for demonstration but also directly help farmers to increase their efficiency in those directions required by national policy and individual profit.

Total shipments of sulphate of ammonia from the United Kingdom during 1953-54 amounted to 299,000 tons, 34% less than in 1952-53 when exceptionally large shipments were made.

North Eastern Coke Officers

Following the appointment this summer of Mr. D. G. Wilson as Coke Officer to the Board and the introduction of a new coke marketing scheme in October, the North Eastern Gas Board has lost no time in taking further steps to improve and develop coke sales and service in its area. Coke Officers have now been appointed for each of the six Groups of the Board, as follows:

Bradford: G. Thorley (Bradford Group).

Huddersfield/Halifax: F. Sutcliffe (Huddersfield/Halifax Group).

Hull: W. Bedwell (Hull Group).

Leeds: A. E. Bloomfield (North Thames Gas Board).

Wakefield: T. N. Hellowell (Huddersfield/Halifax Group).

York/Harrogate: L. C. Johnson (Eastern Gas Board, Cambridge).

Humphreys & Glasgow, Ltd., have received an order for the complete pit top decking and mine car circulating plant at Glyncorrwg South Pit, No. 2 Area of the National Coal Board (South Western Division). The plant will be hydraulically operated throughout and will include decking lifts and car cleaning plant of advanced design. The contract includes the building and structural steelwork.

OXFORD STREET STORE WARMING

DUCTED AIR AFFORDS COMFORT TO CUSTOMERS AND STAFF

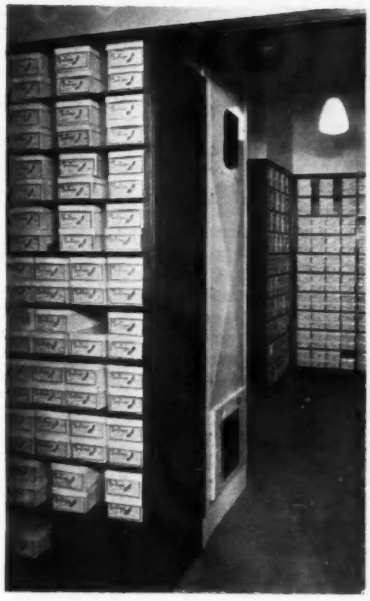
The Radiation system of central heating by ducted warm air has been installed in the extension to Abbotts (Phit-Eezi) Shoe Store at 324, Oxford Street, London, the Company having acquired an additional floor. This system was first used in shoe stores by Abbotts and their architects, Vigers & Co., and its success outside London has encouraged them to adopt the system in the West End.

This unit is operated by gas, the thermostatic control giving the desired temperature uniformly distributed, with a variation of not more than 1°F. at any point.

The unit operates from a small stockroom and requires only 2 sq. ft. of space. From the bottom of the unit warm air is carried in lagged metal ducting (built into the fitments) at floor level. Warm air is discharged from registers placed in the front of fitment plinths and return air taken through grilles in a false ceiling at the top of the unit.

When the room thermostat calls for heat, the gas burner is turned on and its fan set in motion, bringing a flow of warm air until the desired temperature is reached. Then the gas is automatically turned off and the fan stopped, which ensures economy in operation and obviates overnight heating.

The shopfitters for Abbotts were E. Pollard & Co., and the agents for Radiation, Ltd., were Broad & Co., Ltd.; decor by A. J. Milne.



The heating apparatus for the new floor extension is lodged in a stockroom whence ducted warm air, thermostatically controlled, brings an even room temperature throughout the floor. Fuelled by gas, this system of heating obviates overnight heating and stoking and gives maximum comfort to patrons and staff.

Part of the new addition to the premises of Abbotts (Phit-Eezi), Ltd., at 324, Oxford Street, London. The unobtrusive Radiation system of whole house warming by ducted air gives a thermostatically controlled even temperature throughout the floor. Warm air is brought through the duct below stairs and discharged through a false ceiling duct in the centre. A thermostat is visible on the landing.

GAS CONSULTATIVE COUNCILS

Margins on Standard Cookers

Sir Ernest Smith, Chairman of the Industrial Coal Consumers' Council, has replied to the suggestion made by the Northern Gas Consultative Council that the gas industry should pay a flat rate for coal rather than the present system of coal-field differentials. When the last increase in coal prices was made the Northern Gas Board had to meet a rise which was 2s. 10d. to 3s. above the national average for the gas industry.

Sir Ernest has informed the Consultative Council that although the Industrial Coal Consumers' Council has consistently opposed the principle of a flat rate increase and is of the opinion that any renewed application of flat rate increases would again tend to destroy any reasonable relationship between the prices of various qualities, it is convinced that the price structure must possess a measure of elasticity if it is to serve the changing circumstances of the industry.

He adds: 'It should not be assumed, therefore, that the particular methods adopted by the National Coal Board in determining recent increases will be repeated on any future occasions when the adjustment of prices is made.'

At the December meeting of the Gas Consultative Council, Mr. J. T. Adamson said that while considerable time had been spent in seeking some redress in coal prices he did not think the solution of the problem of producing cheaper gas lay in that direction, but rather in different methods of manufacture and more storage capacity. He drew attention to the Rochdale process developed by the North Western Gas Board.

Alderman Joseph Hoy, Chairman, said the Northern Gas Board was pioneering a scheme on Tees-side to convert a disused salt mine into an underground gasholder. The Board had agreed in principle with Imperial Chemical Industries on details of methods and price of construction, but agreement had yet to be reached with the owners of the surface land, Dorman Long & Co., Ltd., for final permission to go ahead.

Mr. R. A. Cookson congratulated Alderman Hoy on the cogent and forceful way he had presented his arguments to the Industrial Coal Consumers' Council. He was glad to see that reference was made to the point he himself had made from time to time, that a cheap and plentiful supply of gas was something that had always belonged to that area and was a real asset in the development of industry. He did not think it could be over-emphasized that when a firm installed gas-burning apparatus in a plant it involved heavy capital expenditure and this was usually done on the assumption that gas would be available at a reasonably constant price in relation to other types of fuel.

The Northern Gas Board in a letter to the Council stated that from the beginning of the next financial year it would adopt an uplift of 33⅓% on makers' wholesale prices of all standard lines of cookers offered for sale throughout the country. This would result in retail prices of these appliances being identical in the Scottish, Northern, North Eastern, and North Western areas. In other areas prices were already at or above these levels.

Alderman Hoy said that the Gas Council had recommended an uplift of 37½% on all appliances by all boards throughout the country, but the Northern Board felt that 33⅓%—a percentage which had been agreed by its three neighbours—would be sufficient to meet the increased cost of storage, transport, fixing and maintenance, together with showroom and other selling expenses.

Alderman H. Sutcliffe expressed surprise at the amount of the on-cost on appliances which he felt far exceeded what was added by many private firms. Mr. E. Corrigan pointed out that there were very few firms selling to the public who had to maintain a staff to keep in order the articles sold. He thought that in view of the present-day costs of transportation, fixing and maintenance, the on-cost was not unduly high. The wages of sales staffs and craftsmen had increased considerably in the past 12 months. He regretted, however, that it was not a move by the Gas Council to reduce the percentage throughout the country to the lower level which the four northern boards were adopting. It was agreed to accept the Board's decision.

North Western Gas Surplus

Mr. D. P. Welman, Chairman of the North Western Gas Board, told the North Western Gas Consultative Council at Manchester on December 9, that the last accounts showed a surplus of approximately £1 mill. but since the beginning of the new accounting period additional costs had fallen on the Board, represented by increases in coal, freight, wages, salaries, amounting to £1,500,000 so that it became necessary to raise another £500,000 to break even.

'We shall have no increase in gas prices this year unless we have to face material increases in the cost of coal or some other item' said Mr. Welman. 'Such is my confidence in our organisation that I expect to make that extra £500,000 from further economies. What about next year? The increases to which I have referred will amount to £2 mill. in a full year. Despite that, we shall not increase the price of gas next year unless coal or some other major item of costs goes against us.'

Last year, £1,950,000 had been saved by increased efficiency and there were few economies that could still be made. Since vesting day the Board had increased its load by over 15%. If the Beaver report on cleaner air was carried out and the Board was given the coal saved, by the greater use of solid smokeless fuels, it could make very rapid strides indeed, not only in providing smokeless fuel, but cheaper gas and, he hoped, cheaper solid fuel.

The 'Rochdale' process had given latitude and flexibility to tackle any problem with solid smokeless fuels. Provided the coal was available, the Board could meet any demand for additional smokeless fuel, solid or gaseous.

A report from the Board to the Consultative Council dealt with the respective advantages of collecting-boxes and a stamp scheme to help customers to save money towards the payment of quarterly accounts. The Board has introduced a collecting-box system. The report states:

'As far as the payments of gas accounts are concerned, it should be remembered that 1,150,000 of the Board's 1,670,000 domestic consumers, or 70% obtain their supplies of gas through prepayment meters, and therefore, pay for the gas, in effect, as it is used. There remain 520,000 domestic consumers with credit meters, presumably largely those people who can and wish to pay quarterly. There may, however, be a sufficient number to justify the operation of one or other of the schemes, if directed towards the payment of gas accounts only.

'The advantages of collecting-boxes would seem to outweigh those attaching to a stamp scheme, which might be summarized as follows:—(a) Payment on account is secured in advance of the due date, (b) the customers would visit the service centres more often than normally; (c) the money deposited in the boxes would be immobilized as it is in prepayment meters.

'The Board is of the opinion that the collection-box scheme has more merit than the alternative scheme, for the following reasons:—

(a) It is more convenient to the consumer, because the collection-box is in his possession, and he does not have to visit service centres or other premises at which stamps might be issued in order to set aside the money.

(b) The box will be less easily lost or misplaced than would the stamps.

(c) The contents of the box may be used as the consumer wishes, though the opening of the boxes in the service centres, generally, would ensure that the contents would be used to discharge outstanding accounts.

(d) With the box scheme, there would not be, as there might well be with a stamp scheme, complications arising from the record of an unpaid account which might warrant the cutting off of a consumer's gas supply, when in fact, stamps were in the possession of the customer to a value exceeding the amount due.

(e) It is less costly to administer even after taking into account the interest

earned on money received in advance through the sale of stamps.

'The following figures would appear to substantiate the above conclusions:—

(a) The sale of stamps at the rate of 25,000 to a value of £3,000 per week would result in an annual income from this source of £156,000 from 1¼ mill. stamps.

(b) From these figures it would seem fair to assume that the super interest earned would not be on a greater amount than the value of 13 weeks' sales of stamps, representing £39,000. At the average rate of interest of 3½% in, say, the year 1953-54 the annual saving would work out at £1,400.

(c) It is considered that this saving could not compensate for the cost of printing over 1¼ mill. stamps of distinctive design, of issuing and recording the sale and stock of stamps at the many issuing premises, of necessary security precautions, of cancelling used stamps and of the staff's time in dealing with customers several times in connection with one account.'

Alderman C. E. P. Stott, Chairman, reported that a request had been made to the North Western Gas Board for a graph showing the number of domestic consumers using 10 or less therms per quarter, 11 to 20, 21 to 30, and over 30 therms per quarter. He had been informed that the information was not available and to attempt to obtain it would entail a considerable amount of work. Even to obtain such an analysis on a 'running' basis as the meter readings were taken would result in substantial cost.

Cork Gas Workers' Pay

The Eire Labour Court on December 17 heard an application by the Cork branch of the Irish Transport and General Workers' Union on behalf of 40 regular shift workers and some relief shift workers of the Cork Gas Consumers' Company for payment of double time for Sunday work.

For the Union, Mr. E. Wall said even in this atomic age scientists apparently could not devise any system whereby gas could be stored for Sunday use. If the people were to be supplied with gas on Sundays men must work, and they must be compensated. He contended that the granting of their application would not mean any appreciable rise in the cost of production and could not, therefore, affect the price of gas.

Mr. J. O'Brien, Director-General of the Federated Union of Employers, said shift workers had three weeks annual leave against two weeks for day workers. This came as a result of negotiations—as a measure of compensation for doing Sunday work. When the men worked on Bank Holidays they received time and a half, with double time for Christmas Day and a day off subsequently with pay.

In reply to the Chairman it was stated that if granted the increase would mean an average of 12s. 6d. per week.

The Court is considering the application.

SCOTTISH JUNIORS JOINT MEETING

A joint meeting of the Western and Eastern Sections of the Scottish Junior Gas Association was held in Edinburgh on December 4, and had as guest speaker Sir Andrew G. Clow, Chairman of the Scottish Gas Board. Guests at the meeting included Mr. R. H. Bone, Commercial and Sales Officer of the Scottish Gas Board, and Mr. J. L. Warrander, Senior Scottish Officer of the Ministry of Fuel and Power.

Mr. D. C. Elgin, President of the Eastern District, opened the meeting by saying that the Eastern District had no reason to be ashamed or despondent about the attendances at recent meetings. But the size and distinction of the gathering that afternoon was more than satisfactory, and therefore benefited the first joint meeting in the Jubilee session of both associations. He offered congratulations on behalf of the Eastern members to the West on completing 50 years of service to the gas industry, and said that he was sure they would survive the new tasks and fresh challenge of the future with renewed glory.

Mr. Elgin said at this point that he was tempted to reflect on the long and happy association of the two sections and to stress the independence and individuality of both of them particularly with regard to each other, but fortunately, he said, he was reduced to silence by the profound observation, by Confucius, he supposed, that the gas jet that makes the most noise does not give the most light. 'In arranging for the Edinburgh joint meeting with the Western District,' he went on, 'we always feel an obligation to provide a paper or address of special quality. For that reason we try, if possible, to have one of our own members as the speaker on that occasion. This year I am happy to say we have been able not only to continue but to perfect that policy by persuading one of our Honorary Members to address us today—I refer, of course, to Sir Andrew Clow, Chairman of the Scottish Gas Board, who requires no further introduction to this audience.'

Sir Andrew Clow then addressed the Juniors and spoke at some length on the arguments for and against nationalisation, referring to its developments, its advantages and disadvantages, and in particular his experiences of it during his career in India.

Mr. Colin Campbell, Vice President of the Western District, opened the discussion which followed, while others taking part included Messrs. Campbell (Grangemouth), Yule (Galashiels), Wilson (Dundee), Macdonald (Perth), Patterson (Dumbarton), Aitken (Dundee), Greig (Glasgow), Drummond (Dundee), and Cameron (Grangemouth).

Mr. G. Royden, President of the Western District, moved the vote of thanks to Sir Andrew for his address.

NEW SHOWROOMS FOR OLDBURY

An ultra modern gas service centre was opened in Birmingham Street, Oldbury, early in December, by the Mayor and Mayoress, Councillor and Mrs. J. D. Beard. With its concealed lighting effects, pastel coloured walls, and lavish fitments the centre is a housewife's paradise. The Mayoress at the opening said: 'We housewives just don't realise how up-to-date gas is, how many different purposes it serves, and how much we depend on gas. There is even a gadget—run by gas—to curl your hair.'

Speaking at the luncheon held at the Talbot Hotel, before the opening ceremony, the Chairman of the West Midlands Gas Board, Mr. G. le B. Diamond, said: 'The additional facilities provided by the new showrooms and their convenient situation would undoubtedly be appreciated by consumers in the Oldbury area, proof of whose gas-mindedness was revealed by the fact that sales of appliances per consumer were the highest in the Walsall Division for the Board's last financial year.' Continuing, Mr. Diamond said that appliance sales had reached a total of £10 mill. since vesting day, and 85% of all new houses were equipped for gas cooking. The Board's turnover was now £38 mill. per annum. Unhappily, there had been a delay in fixing appliances in some districts, and recently they had to decline an invitation to tender for carcassing houses being erected by the Oldbury Corporation. They were pleased to note that consumers in the Oldbury and West Bromwich area had expressed appreciation of the speedy service given by the radio-controlled emergency service vans.

City and Guilds Prize Awards

Prize awards were made by the Council of the Society of British Gas Industries in connection with the recent City and Guilds of London Institute Examinations in Gas Technology (Supply) and Gas Fitting as follows:

Gas Technology (Supply) 1st Prize (£3 3s.) William A. Saunders (36) district representative, student of the L.C.C. South-East London Technical College; 2nd Prize (£2 2s.) Albert L. Skinner (41) district representative, student of the L.C.C. South-East London Technical College.

Gas Fitting—Intermediate Examination 1st Prize (£2 2s.) Alexander J. F. Richards (25) gas fitter, student of the Brighton Technical College; 2nd Prize (£1 1s.) Peter F. Collins (18) an apprentice gas fitter, student of the Maidstone Technical College.

Gas Fitting—Final Examination 1st Prize (£3 3s.) Robert Powell (34) gas fitter, student of the City College of Building, Liverpool; 2nd Prize (£2 2s.) Charles E. Gibson (39) gas fitter, student of the Maidstone Technical College.

SUMMER WARMTH IN WINTER

A new Radiant Heating installation outside the Wales Gas Board showrooms at Barry, Glamorgan, where its warmth is obviously enjoyed by the shoppers. The gas heaters give warmth in all weathers, and are unaffected by rain, snow, or gales. A batch of these heaters is being sent to the Middle East for use in the heating of open air cinemas, where they will operate on natural gas.

The warming of streets and open spaces by overhead heating, featured in many winter pictures from the Continent during the Christmas shopping period, is gaining in popularity in Great Britain as well as in other parts of the world. The new installation in a South Wales shopping centre illustrated below is a noteworthy example of the system in operation.

The No. 5 gas overhead heater (manufactured by Radiant Heating, Ltd.), of which two can be seen in the Barry photograph, comprises a refractory block in which there are 64 combustion tunnels, each fitted with a multi-hole tube. This refractory block is securely fixed into a cast-iron vitreous enamelled container, provided with four fixing studs on the top of the heater, enabling it to be fitted in a horizontal position. The heater operates on low pressure gas and fan air at about 10 in. W.G. The gas rate of this heater, which is of neat appearance, is approximately 100 cu.ft. per hour and for fitting outside shops, or under canopies, the heaters are usually fitted at intervals approximately 12 to 15 ft. apart.

The ideal mounting height is from 12 to 15 ft. If necessary, the heater can easily be provided with electric flash ignition. A standard extra long sparking plug screwed into the side of the heater has been found satisfactory for igniting the heater, thus avoiding any possibility of the pilot light being blown out. For single, or possibly two, heaters, the flash ignition comprises a magneto type flasher, which does not require electrical connections. The magneto flasher is connected to the sparking plug by means of standard H.T. cable.

Ancillary equipment may be summarized as follows: One main gas governor; diaphragm control valve, which will cut off gas in the event of failure by the fan, and will not allow gas to flow to heaters unless the fan is in operation; back pressure valve; and a direct-coupled motor fan set.

With a number of heaters outside a shop—say, 10 heaters—electric flashing equipment is desirable and on such an installation starting up would be arranged as follows: (1) Switch on motor fan set, which would automatically energize the electrical flashing unit, causing a continuous sparking at the heater; (2) diaphragm control valve would lift, allowing gas to flow to heaters which would become ignited by the electric flasher. For shutting down it would only be necessary to switch off the fan.

A timing device could be incorporated so that the electric flasher would be in operation, say, for three minutes (or any other pre-determined time) after switching on, when the flasher would automatically stop, so that the sparking plugs would spark only when the heater was first switched on. The timing device would automatically re-set itself, so that if the heaters were turned off during the morning and were switched on again in the late afternoon, the cycle mentioned above would be repeated.

Mains Entertain Central Sales Circle

To conclude the 1954 series of visits by sales and service representatives of the North Thames Gas Board to R. & A. Main's Edmonton Works, 40 members of the Central Sales Circle, led by Mr. D. H. Rouse, Commercial Assistant, Central Division, made a comprehensive tour of the R. & A. Main and Main Enamel Manufacturing Company's factories. The itinerary for their tour of R. & A. Main's factory included the mechanized and the floor foundries, the core shops, the fettling, drilling press and enamelling shops and finally the fitting shops, where the visitors watched the assembly, testing, and final inspection of the 'London' and other cookers. The complete tour occupied the morning and afernoon. After concluding the first section of the tour the visitors enjoyed luncheon at the Cooks Ferry Inn, and were later entertained to tea in the R. & A. Main staff canteen.

At luncheon, the party was welcomed by Mr. C. A. Macleod, Sales Director, R. & A. Main, Ltd., who said that during the past few years they had had the privilege of receiving many parties of visitors from the North Thames and other boards, and looked forward with pleasure to receiving many more in the future. Mr. Macleod recalled the many events of the past in which the old Gas Light and Coke Company and Mains had been closely associated. Since nationalisation that record of friendship and co-operation had been even more marked. One of the results of such collaboration could be seen in the 'London' cooker, one of the most popular on the market today, and one which was playing an important part in combating electrical competition.

On completion of the tour Mr. D. H. Rouse proposed a vote of thanks to R. & A. Main for their hospitality. Although they had seen the manufacture of other appliances, their special interest had been in the 'London' cooker, an important factor in their consolidation of the cooking load and new housing effort. Without the 'London' they would be the poorer, for their electrical competitors were unable to offer such a modern, efficient cooker at such a reasonable price. In conclusion Mr. Rouse thanked the guides for their part in making the day so pleasant and instructive.

New Houses at Kevlin Road, Omagh, Co. Tyrone, will have no gas supply, it was stated at a meeting of Omagh Urban Council. The Town Clerk (Mr. J. McGale) explained that to supply the 117 houses with gas would entail not only laying a new main to the district, but the provision of new equipment at the gasworks. The Finance Committee had fully considered the matter, and estimated that it would cost £70,000 to provide the service which would bring in a revenue of about £1,200 per annum, which was not remunerative.

Calendars and Diaries

The season of goodwill has brought many tangible expressions of new year wishes in the form of calendars, diaries, and other useful devices for reminding us of our friends throughout 1955. We take this earliest opportunity in the new year of expressing our appreciation and reciprocating the good wishes which accompanied these tokens.

From the East Midlands Gas Board we have received a copy of the 1955 *Year Book* which is again noteworthy for the very conveniently arranged information concerning the area, divisional, and district personnel and the principal diary events of the year. It is from the *Year Book* that we derive our earliest intimation of the annual staff conference at Skegness—this year on April 28 and 29; we are also glad to have advance notice of the British Road Tar Association meeting and dinner on October 25. The North Western Gas Board has sent us a copy of its Emett calendar—featuring a fantastic yet convincing conception by the famous *Punch* cartoonist of the far-reaching importance of the Rochdale process.

From contractors and appliance makers we have received the following:

Allied Ironfounders, Ltd.—Pocket diary for 1955.

British Oxygen Co., Ltd.—The B.O.C. desk diary, including information on the services rendered by the Company to industry in general.

Thomas Broadbent & Sons, Ltd., Huddersfield.—Vest pocket notebook.

R. & J. Dempster, Ltd.—Set of 1955 date cards for the familiar R. & J. D. retort-shaped desk calendar.

Drakes, Ltd.—Refill for pocket diary.

Dunlop & Ranken, Ltd.—Monthly tear-off wall calendar, with 'year-at-a-glance' on reverse side.

R. & A. Main, Ltd.—Vest pocket diary.

Standard Furnace & Setting Co., Ltd., Southport.—Pocket diary for 1955, with useful data and road maps.

Stewarts & Lloyds, Ltd.—Office desk calendar.

Richard Sutcliffe, Ltd.—Daily tear-off calendar featuring coloured photograph of Thornton-le-Dale, Yorkshire.

Westwood & Wright, Ltd.—Bold figure monthly tear-off wall calendar.

Widnes Foundry & Engineering Co., Ltd.—Pocket diary.

Hugh Wood & Co., Ltd.—Wall calendar.

An Advertisement of a Warwick gas cooker in a recent edition of *Ideal Home* so impressed an army officer who saw it while serving in the Canal Zone that he wrote straight away reserving one. His request was dealt with immediately by the Leicester and Northants Division of the East Midlands Gas Board.

The Boards of Thomas De La Rue & Co., Ltd., and Sidney Flavel & Co., Ltd., announce that they have entered into negotiation with a view to merging their interests in the manufacture and marketing of gas, solid fuel and heating appliances. A further announcement will be made at an early date.

Festive Season Window Displays

Instead of the traditional pantomime or Father Christmas themes usually portrayed as window displays at the Christmas season, the chief showroom windows of the Northern Gas Board at Newcastle-upon-Tyne created special attraction by their unique presentations, still in keeping with the festive season atmosphere.

One large window was devoted to the theme 'The Twelve Days of Christmas,' an old ballad lately brought back to favour by the radio. The 12 verses of the ballad, adapted to suit gas publicity, were shown on 12 heart designs pierced by arrows, together with the appropriate gas appliances given by the suitor to his lady-love (wording attached). Large crowds were drawn to read the whole of the verses after reading the first one or two.

Another large window displayed an 8 ft. wide mock Christmas cake with mock 'snow' icing, silver plinth, and all its trimmings. A cut section of the cake displayed a festive dining room on one side with table laden with 'good-cheer' and the other a model gas kitchen. An illuminated old inn sign gave its greeting to customers.

THE 'BAMBURGH'

The article on 'New Fires during '54", published in the December 29 issue of the 'GAS JOURNAL', contained a note on the Portcullis 'Bamburgh' convector gas fire. Unfortunately, due to a printers' error, the illustration accompanying it showed the Radiation 'Vecta Beam' convector fire, details of which were published on December 1, 1954, p. 629. The 'Bamburgh' appears above.

The 12,000 Gas Lamps which provide lighting for Edinburgh's streets are to be replaced by electricity at a cost of £625,000. At present £15,000 is spent each year on conversion, and when the Works Committee was told that it would take 40 years to complete the job at this rate it accepted a recommendation to speed up the changeover.

Diary

Jan. 7.—LONDON JUNIORS: 'International Gasworks Practice,' J. D. Grant. 178, Edgware Road, 6.30 p.m.

Jan. 7.—WALES G.C.C.: Shire Hall, Shrewsbury, 2.30 p.m.

Jan. 8.—SCOTTISH JUNIORS (EASTERN): Short Paper Day. Dundee.

Jan. 12.—MANCHESTER JUNIORS: Short paper for 'F. Johnston' prize. Manchester Demonstration Theatre.

Jan. 12.—SOUTH WESTERN SECTION, I.G.E.: 'Is the Balance of Industry being unreasonably tilted by emphasis on Joint Consultation, Education, and Welfare Services? ', Dr. K. P. Duncan and K. E. Stringer; at Taunton, 2.15 p.m.

Jan. 14.—SCOTTISH JUNIORS (Western District): 'Letting Steam Off,' J. R. MacOwen. 522, Sauchiehall Street, Glasgow, C.2. 6 p.m.

Jan. 15.—YORKSHIRE JUNIORS: 'Coke—The Smokeless Fuel,' W. I. Ineson. Harrogate.

Jan. 17.—WEST MIDLANDS G.C.C.: Committee Room, Gas Offices, Edmund Street, Birmingham. 2.30 p.m.

Jan. 18.—LONDON AND SOUTHERN SECTION, I.G.E.: 'Sales and Service Organization at Tottenham,' S. A. King and J. E. Law. 17, Grosvenor Crescent, London, S.W.1, 2.40 p.m.

Jan. 18.—BRITISH INDUSTRIAL MEASURING AND CONTROL APPARATUS MANUFACTURERS' ASSOCIATION: Annual Luncheon, Londonderry House, Park Lane.

Jan. 20.—MIDLAND JUNIORS: Visit to The Jeavons Engineering Co., Ltd., Tipton.

Jan. 20.—INSTITUTE OF FUEL: 'The Beaver Report,' Discussion to be opened by Dr. G. E. Foxwell, at the Institution of Civil Engineers, Great George Street, 5.30 p.m.

Jan. 20.—LONDON JUNIORS: Visit to a coal mine in the Cannock area.

Jan. 22.—WESTERN JUNIORS: 'Industrial Development in the Rural Areas,' E. I. Luscombe. Exeter.

Jan. 26.—EASTERN JUNIORS: 'Steam Utilization in the Gasworks,' G. S. Hall. Cambridge.

Feb. 1.—LONDON AND SOUTHERN SECTION, I.G.E.: 'Atmospheric Pollution,' discussion led by a team arranged by Dr. G. E. Foxwell, 17, Grosvenor Crescent, S.W.1, 2.40 p.m.

Feb. 1.—SOUTH EASTERN G.C.C.: Caxton Hall, Westminster. 11 a.m.

Feb. 2.—MANCHESTER JUNIORS: Visit to English Steel Corporation, North Street Works. 'Use of Fundamental Data in Gasworks Plant Design,' R. Pollard.

Feb. 4.—LONDON JUNIORS: 'Burner Design,' J. Prigg. 178, Edgware Road, London, W.2. 6.30 p.m.

Feb. 8.—MIDLAND JUNIORS: 'Purification,' F. Grocott. Birmingham.

THOMAS BAYLEY (GREAT BRIDGE) LTD.
BAGNALL STREET, GREAT BRIDGE, STAFFS.
Telephone: 1587 Tipton
Manufacturers of Best Staffordshire Blue, Brown and Red Engineering Bricks
Blue pressed and Wirecut Paviors for Hopper Linings and Retort House Floors

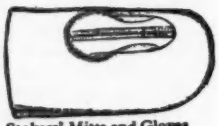
EWART CHAINBELT CO., LTD.
DERBY, ENGLAND
Driving and Conveyor Chains of the best quality; made of Ley's Celebrated Blackheart Malleable Iron.
ALSO COMPLETE CONVEYORS AND ELEVATORS

CASES FOR BINDING
Quarterly Volumes of the 'Gas Journal'
7/6 each, post free
Walter King, Ltd., 11, Bolt Court, Fleet Street, London, E.C.4.

THOMAS BUGDEN & CO.
India-Rubber and Airproof Manufacturers and General Contractors.
LARGEST MANUFACTURERS OF GAS MAIN BAGS.
Telegrams—"Airproof, Barb, London." Telephone—6147 Clerkenwell
Contractors to H.M. Government

Gas Bags for Repairing Mains
PATENTEES OF THE
DENMAR BAG
Impervious to Main Liquor and Climatic Influences.

Round or Cylinder Shape.

Pull-through and Expanding MAIN STOPPERS.
All types of INDIA-RUBBER BOOTS.
DRAIN RODS AND WHALE-BONE BRUSHES.
HOSE AND TUBING FOR ALL PURPOSES.

Stokers' Mitts and Gloves of every description.
Contractors' & Miners' Woollen Jackets, Trousers, Hats, &c. 244, Coswell Road, LONDON, E.C.1.

J. BROWN & CO. LTD.
SAVILE TOWN, DEWSBURY, YORKS.
Supply:–
"BROWNOX-de-LUXE" PURIFYING MATERIAL
Purchase:–
SPENT OXIDE

UNDERPRESSURE ENGINEERING CO., LTD.
UNDERPRESSURE CONNECTIONS
SPLIT COLLARS
SOCKET CLIPS
UNION FOUNDRY, MANSFIELD, NOTTS.
ALL TYPES OF DISTRIBUTION MATERIAL IN STOCK
Service Enquiries:
STAFFORD HOUSE, NORFOLK STREET, STRAND, W.C.2.
'Phone: MANSFIELD 1256. *'Grams:* CASTINGS, MANSFIELD.
'Phone: TEMPLE BAR 9910. *'Grams:* WASHER, ESTRAND, LONDON
CENTRAL ACTION DRILL STANDS
SERVICE CLEANSERS
TOOLS, ETC.

COAL AND COKE SCREENING & SIZING PLANTS.
RETORT SETTINGS PRODUCERS, FURNACES REPAIRS.
GOODALL, CLAYTON & Co. LTD.
LEEDS.
CONVEYORS, ELEVATORS, BUNKERS, ROOFS, HOISTS, Etc.

GAS RETORTS
HARRIS & PEARSON
STOURBRIDGE, ENGLAND LTD
INSULATING BRICKS, RECUPERATOR TUBES, SPECIAL SEMI-SILICA QUALITY FOR SEGMENTAL RETORTS WITH NO EXPANSION OR CONTRACTION AT 1400° C
Manufacturers of
Fire Bricks, Lumps & Tiles
OF EVERY DESCRIPTION

OXIDE

DUTCH AND DANISH BOG ORE
SPECIALLY ACTIVATED OXIDE OF IRON

Oxide supplied on loan or sale outright.
Highest prices paid for Spent Oxide

Send your enquiries to

AS PURIFICATION & CHEMICAL COMPANY LIMITED

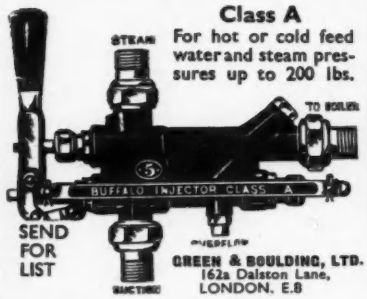
ESTABLISHED 1873

PALMERSTON HOUSE, BISHOPSGATE, LONDON, E.C.2.

Telegrams: "Purification, Stock, London." Telephone: London Wall 5077

BUFFALO INJECTORS

Class A
For hot or cold feed water and steam pressures up to 200 lbs.



SEND FOR LIST

GREEN & BOULDING, LTD.
162a Dalston Lane, LONDON, E.8

ROOK BROS. LIMITED

FOR—

Every aspect and requirement connected with the

STRUCTURAL STEELWORK
of
GASHOLDERS
and
GASWORKS PLANT

ENQUIRIES INVITED:

32, Collier Row Lane,
ROMFORD, Essex.
Tel.: Romford 5174

The
LIMIT OF EFFICIENCY CAN BE REACHED
by the use of

LUX

GAS PURIFYING MATERIAL

Sole Importers:

HARRISONS (London) LIMITED
66, Mark Lane, LONDON, E.C.3

Telegrams: Birchrock, London *Telephone:* ROYal 3120

MISCELLANEOUS

SMALL single truckloads and larger quantities of good ROUGH BREEZE from any gasworks, large or small, in the United Kingdom required by merchants paying own railway tolls. Cash price and particulars to: No. 9378, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

"KLEENOFF" *
THE COOKER CLEANER
"KLEENOFF"
FIBRE BRUSHES
RUBBER MOPS
"KAY-DEE" *
KETTLE DESCALER

For resale to the public, and in bulk for works use.

BALE & CHURCH, LTD.
7, CROMPTON WAY, CRAWLEY, SUSSEX

APPOINTMENTS VACANT

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

SCOTTISH GAS BOARD

FIFE GROUP
DUNFERMLINE
TECHNICAL ASSISTANT (CHEMICAL)

APPLICATIONS are invited for the position of TECHNICAL ASSISTANT (CHEMICAL).

The salary will be Provincial 'A', A.P.T. VI (£530-£610).

Applicants should have a sound knowledge of the control of gas manufacture and be experienced in the carrying out of all the usual Gas Works tests.

The position is pensionable and the successful applicant may be required to pass a medical examination.

Applications endorsed 'Technical Assistant' (Chemical) giving full particulars of age, qualifications and experience, together with *copies* of three recent Testimonials, or the names and addresses of three referees to whom reference can be made to be lodged with the undersigned not later than January 19, 1955.

DAVID L. DICKSON,
Group Manager.

SCOTTISH GAS BOARD

FIFE GROUP
ST. ANDREWS DISTRICT
TECHNICAL ASSISTANT

APPLICATIONS are invited for the position of TECHNICAL ASSISTANT to the above District.

The salary will be Provincial 'B', A.P.T. III-V *i.e.* £320-£565 per annum.

Candidates should have experience of Horizontal Retorts, Tully and/or Water Gas Plants.

The position is pensionable and the successful applicant may be required to pass a medical examination

Applications endorsed 'Technical Assistant' giving full particulars of age, qualifications and experience, together with *copies* of three recent Testimonials, or the names and addresses of three referees to whom reference can be made, to be lodged with the undersigned not later than January 19, 1955.

A. A. MORRIS,
District Manager.

SCOTTISH GAS BOARD

LANARKSHIRE DIVISION
DIVISIONAL DISTRIBUTION ENGINEER

APPLICATIONS are invited for the appointment of DISTRIBUTION ENGINEER in the Lanarkshire Division of the Scottish Gas Board.

Applicants should be Chartered Gas Engineers or hold a University Degree or equivalent Technical qualifications, and should be experienced in modern distribution methods within the Gas Industry.

The salary for the post is £800 per annum × £40 to a maximum of £1,000 per annum and is subject to placing in accordance with qualifications and experience.

A house at a reasonable rental is immediately available. The successful applicant will require to pass a medical examination and to subscribe to the Scottish Gas Board Superannuation Scheme.

Applications, stating age, qualifications and experience, together with the names of two referees should be lodged with the undersigned not later than Monday, January 10, 1955.

JAMES M. DOW,
Divisional Controller.

Divisional Offices,
Bothwell Road,
Uddingston,
Lanarkshire.
December 15, 1954.

SCOTTISH GAS BOARD

KILMARNOCK GROUP
GROUP TECHNICAL ASSISTANT

APPLICATIONS are invited for the post of a GROUP TECHNICAL ASSISTANT for the Kilmarnock Group.

The salary will be within the scale A.P.T. 7, Provincial 'A', with placing according to qualifications and experience. The present scale is £585-£665.

Applicants should possess the Higher Grade Certificate (Manufacture) of the Institution of Gas Engineers or an equivalent technical qualification and should be experienced in the operation of all plant usually met with in small and medium sized undertakings.

The post is superannuable and the successful candidate may be required to undergo a medical examination.

Applications, stating age, qualifications and experience, together with the names of two referees, should be addressed to the undersigned within fourteen days from the appearance of this advertisement.

ROBERT FIFE,
Group Manager.

Riverbank Gas Works,
Kilmarnock.
December 28, 1954.

SCOTTISH GAS BOARD

KILMARNOCK GROUP
TROON DISTRICT
ASSISTANT MANAGER

APPLICATIONS are invited from suitably qualified persons for the position of ASSISTANT MANAGER at the Troon District Undertaking at a salary within the Grade A.P.T. 5 Provincial 'B' (£485-£565 per annum) with placing according to qualifications and experience.

Candidates should have sound knowledge and experience of Continuous Vertical Retorts and Distribution practice.

The post is superannuable and the successful candidate may be required to undergo a medical examination.

Applications, stating age, qualifications and experience, together with the names of two referees should reach the undersigned not later than Monday, January 17, 1955.

WILLIAM MARSHALL,
District Manager.

Gas Works,
Barassie Street,
Troon.

WEST MIDLANDS GAS BOARD

WARWICKSHIRE DIVISION
ELECTRICAL ENGINEER—
COVENTRY DISTRICT

THE POSITION involves supervision of installation, maintenance and development of electrical plant associated with gas works processes.

As a minimum qualification candidates should hold a Higher National Certificate in Electrical Engineering and should have had experience in heavy industrial electrification including generation and distribution.

The salary will be within Grade 12 (£790-£915 per annum) of the National Salary Scales for Gas Staffs.

The post is pensionable and the successful candidate may be required to pass a medical examination.

Applications, stating age, personal details, particulars of training, experience, qualifications, together with the names of two referees, should be addressed to Mr. A. Allen, Divisional General Manager, West Midlands Gas Board, Warwickshire Division, Gas Offices, Gas Street, Coventry, to reach him within fifteen days of the appearance of this advertisement.

J. C. INGRAM,
Secretary to the Board.

WEST MIDLANDS GAS BOARD

BIRMINGHAM AND DISTRICT DIVISION
FIRST ENGINEERING ASSISTANT—
WINDSOR STREET WORKS

THE DUTIES will entail supervision of Coal Gas Production on works producing up to 24 millions cubic feet per day. Experience on modern C.W.G. plants and on ancillary plant generally will be afforded.

Candidates should possess the Higher Grade Certificate of the Institution of Gas Engineers in Gas Engineering (Manufacture) (or have passed the Associate Membership examination in gas manufacture) or a University Degree in Engineering; the holding of a Diploma in Gas Engineering (Manufacture) will be an advantage.

The salary will be within Grade 11 (£740-£865 per annum) of the National Salary Scales for Gas Staffs.

The post is pensionable and the successful candidate may be required to pass a medical examination.

Applications, stating age, personal details, particulars of training, experience and qualifications, together with the names of two referees, should be addressed to Mr. J. E. Wakeford, Divisional General Manager, West Midlands Gas Board, Birmingham and District Division, Gas Offices, Edmund Street, Birmingham, 3, to reach him within fifteen days of the appearance of this advertisement.

J. C. INGRAM,
Secretary to the Board.

(*Classified advertisements continued on page* 62)

APPOINTMENTS VACANT (ctd.)

OLD ESTABLISHED gas meter manufacturers require REPRESENTATIVE. Age 25-35. Full training given. Write giving full details of age, education, business experience and salary required to: No. 220, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

WALES GAS BOARD

SWANSEA UNDERTAKING
APPOINTMENT OF
SENIOR TECHNICAL ASSISTANT—
DISTRIBUTION

APPLICATIONS are invited from suitably qualified persons for the above appointment for which the salary will be within the range of Grade 7 to 8 A.P.T. (Provincial 'A')—£585-£705 commencing at a figure commensurate with qualifications and experience.

Applicants should be experienced in Modern High/Low Pressure Gas Distribution Practice, including mainlaying and planning, and in the control of Distribution personnel.

The successful applicant will be required to pass a medical examination (if not already a member of a Gas Board Pension Scheme) and to join the Wales Gas Board Pension Scheme.

Applications stating age, experience, professional qualifications and particulars of training, together with the names of two referees, should be received by the undersigned not later than January 31, 1955.

A. PICKARD,
General Manager and Engineer.

Gas Offices,
Oystermouth Road,
Swansea.

NORTH WESTERN GAS BOARD

APPLICATIONS are invited for the following pensionable appointments:—

WIRRAL GROUP
GROUP DISTRIBUTION DEPARTMENT—
BIRKENHEAD
TECHNICAL ASSISTANT (DISTRIBUTION)

(*Salary within Grade A.P.T. 8—£625-£705 per annum*)

The successful applicant will be required to carry out all types of technical work in connection with gas distribution.

Applicants should preferably hold the Higher Grade Certificate in Gas Engineering (Supply) of the Institution of Gas Engineers or an equivalent qualification, and should have experience of gas distribution practice.

DRAUGHTSMAN
(*Salary within Grade A.P.T. 7—£585-£665 per annum*)

Applicants should have knowledge of the design and layout of distribution plant including boosters and governors, and plan records of mains systems. A knowledge of surveying and levelling will be an advantage.

Detailed applications, giving the names of two referees, should reach the General Manager, N.W.G.B. (Wirral Group), Hind Street, Birkenhead, within fourteen days.

LIVERPOOL GROUP
ANALYTICAL CHEMIST—
CENTRAL LABORATORY

(*Salary within Grades A.P.T. 7/8—£585-£705 per annum*)

Candidates should possess an appropriate university degree or be Associates of the Royal Institute of Chemistry. Some experience in an industrial laboratory is desirable.

Applications should be made on the official form obtainable from the Chief Personnel Officer, N.W.G.B., (Liverpool Group), Radiant House, Bold Street, Liverpool, 1, and returned to him within fourteen days.

TECHNICAL REPRESENTATIVES — Newton Chambers & Co. Ltd. invite applications from suitably qualified Engineers with experience in Gas Works and Chemical Plant for positions as Technical Sales Representatives. The appointments are superannuated and carry good salaries and expenses and cars are provided. Applications including details of age, education, qualifications and experience giving an indication of present salary should be addressed in confidence to the Personnel Officer, Newton Chambers and Co. Ltd., Thorncliffe, near Sheffield.

SOUTH WESTERN GAS BOARD

BRISTOL/BATH DIVISION
PRODUCTION DEPARTMENT

APPLICATIONS are invited for the position of TECHNICAL ASSISTANT at the AVON STREET WORKS, BRISTOL.

Salary will be in accordance with Grade APT.V, £500-£580 per annum.

Candidates should have good knowledge and experience of gas manufacture. The manufacturing plant at the Avon Street Works consists of Horizontals and Water Gas.

The successful applicant will be required to pass a medical examination, and to join the Board's Staff Pension Scheme, unless he is otherwise ineligible in accordance with the Rules of the Scheme.

Applications in writing, giving the names of two referees, should be received by the undersigned not later than January 15, 1955.

C. R. INGHAM,
Production Engineer and Manager.

Radiant House,
Bristol, 1.

EASTERN GAS BOARD

IPSWICH DIVISION
BURY ST. EDMUNDS GROUP

FIRST CLASS GAS FITTER required to work in the Sudbury District. Full J.I.C. Rates of Pay (Provincial 'A') and conditions of service.

The Borough Council have arranged to make a Council House available. The successful candidate may be required to pass a medical examination and to contribute to any pension scheme approved by the Board which may be applicable to him at some future date.

Applications, giving age, present duties and references should be addressed to Mr. H. R. Thomas, Group Manager, Gas Works, Bury St. Edmunds within two weeks of the appearance of this advertisement.

EASTERN GAS BOARD

WATFORD DIVISION
APPOINTMENT OF DEPUTY ENGINEERING
(CRAFTS—INCLUDING ELECTRICAL) FOREMAN—LUTON WORKS

APPLICATIONS are invited for the above post. Applicants should be between the ages of 30 and 40 years and preferably have experience of general mechanical and electrical maintenance work in a large gas works, besides the ability to direct and supervise skilled craftsmen.

The successful applicant's salary will be within Salary Grade A.P.T. 5 of the Agreement of the National Joint Council for Gas Staffs ("Fringe" Met.—£520-£600 per annum).

The person appointed may be required to pass a medical examination and, unless already subject to a Pension Scheme by virtue of the Gas (Pension Rights) Regulations 1950, will be required, if eligible, to join the Board's Staff Pension Scheme within six months from taking up the appointment.

Applications should be made in writing to the undersigned not later than January 15, 1955.

R. SUMMERSON,
Works Engineer.

Gas Works,
Dunstable Road,
Luton,
Beds.

SENIOR LADY COOKERY DEMONSTRATOR required by the Parkinson Stove Co. Ltd. Applicant must be competent to discuss the Company's appliances with customers at all levels and must possess recognised qualifications in Domestic Science and wide experience in cookery. This is a senior position for which a suitable salary will be paid, but an indication of salary required should be included in the letter of application, together with age, details of qualifications, experience, etc. Letters, in full confidence, to Personnel Manager, Iron Lane, Stechford, Birmingham, 33.

DOMESTIC UTILISATION OF GAS

SMITH & LE FEVRE

20/- *inc. postage*

WALTER KING, LTD.

11, Bolt Court, Fleet Street,
E.C.4.

PLANT FOR SALE

SINGLE SPEED GEARED MOTORS

A.C. ¼ to 2-h.p. D.C.

Final R.P.M. between ½ and 480

Example prices:

DRIP PROOF ENCLOSED

¼ h.p.	A.C. 3 p.h.	88 r.p.m.	...	...	£16.8.6
1 h.p.	D.C.	88 r.p.m.	...	...	£28.0.0

TOTALLY ENCLOSED

1 h.p.	A.C. 3 p.h.	26 r.p.m.	...	...	£29.4.0
1 h.p.	D.C.	88 r.p.m.	...	...	£34.4.0

STANDARD D.C. MOTORS

⅛ to 2-h.p.

Example prices:

DRIP PROOF

1 h.p.	2,800 r.p.m.	...	...	...	£16.13.0

TOTALLY ENCLOSED

1 h.p..	1,400 r.p.m.	...	...	...	£23.15.0

PRICES OF FLAMEPROOF MOTORS ON APPLICATION

STANLEY ENGINEERING CO.

Established 1910

Telephone 4294/5 **BATH** Grams: Trius

SCRAP GAS METERS WANTED!

A SPEEDY SERVICE

TOP PRICES PAID

Collection arranged from anywhere in U.K. *Truck Loads to our own private siding.*

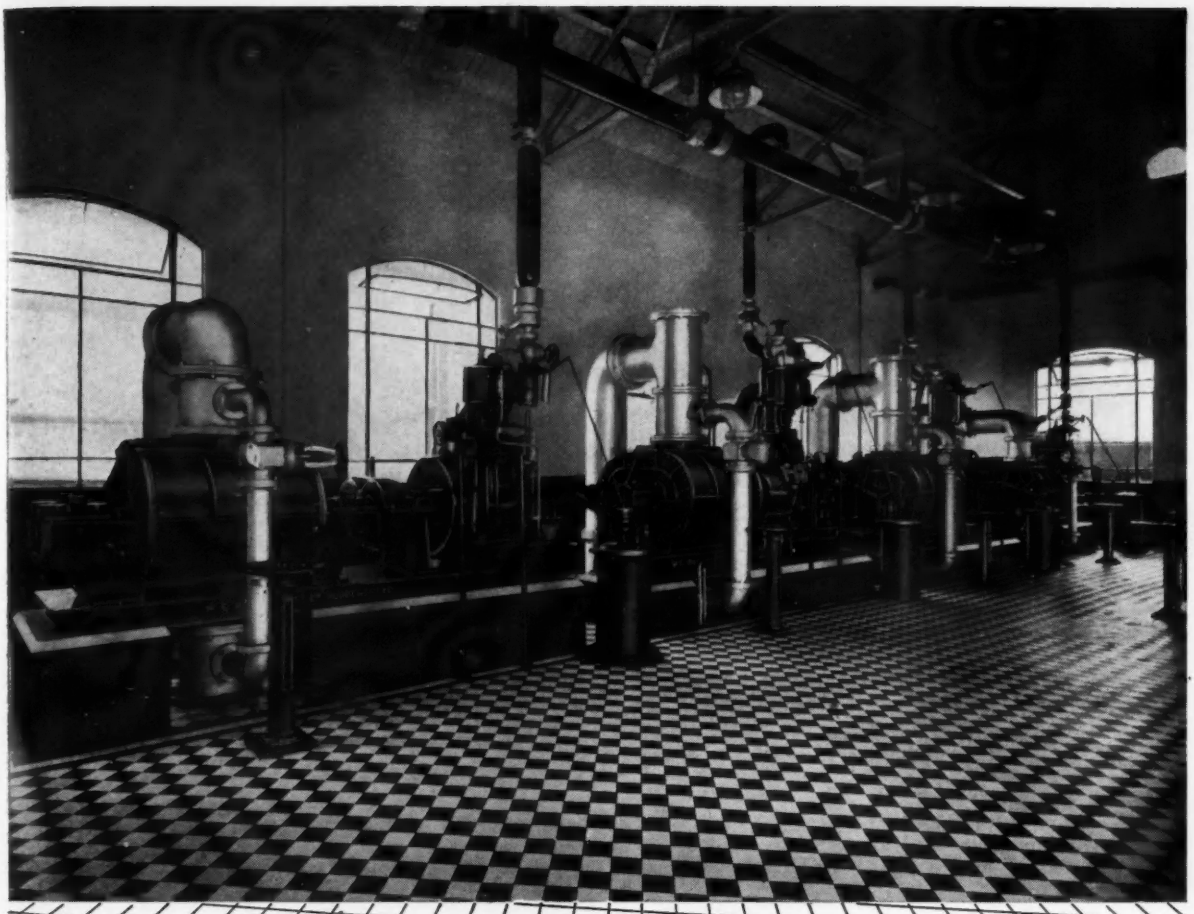
Boddington Lane, Southern Region

Sell to those best suited to deal with them

Sell to **MITCHAM SMELTERS** LTD

ROMETAL WORKS, RED HOUSE ROAD, MITCHAM ROAD, CROYDON, SURREY

TELEPHONE
THOrnton Heath 6101
PRIVATE BRANCH EXCHANGE



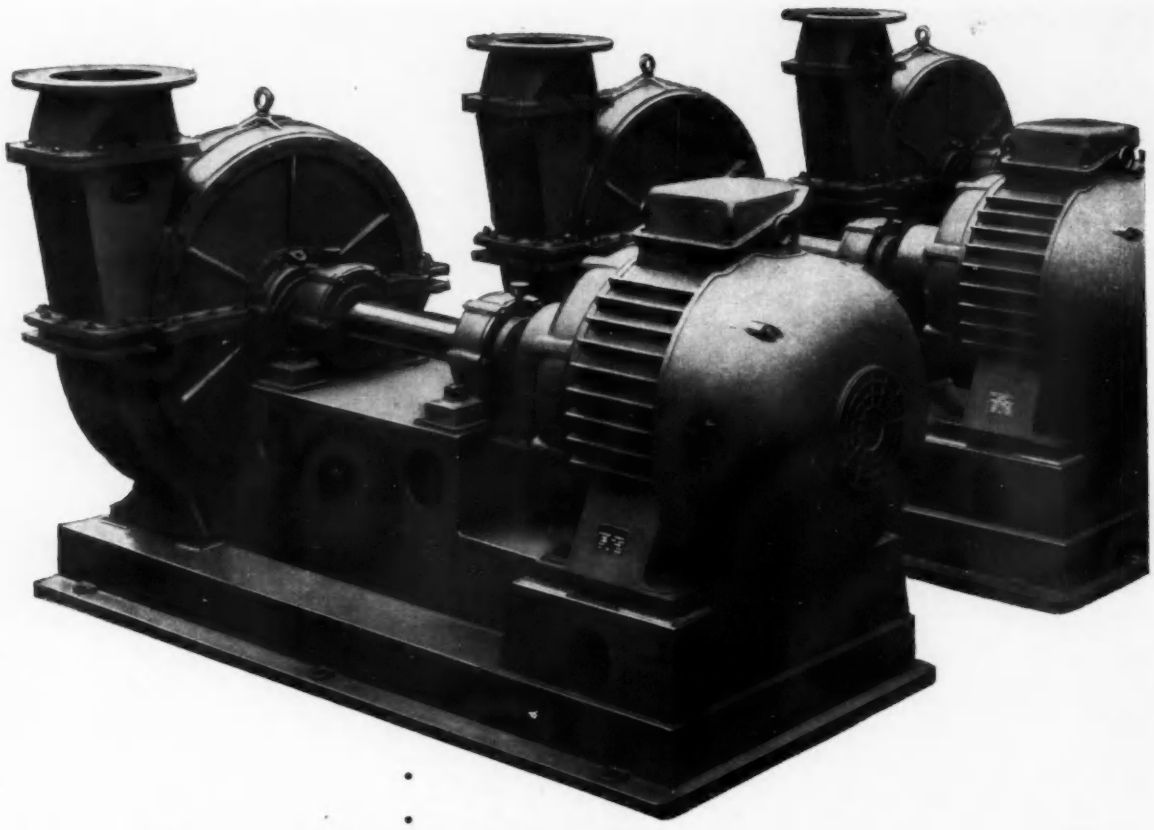
By kind permission of R. L. Greaves Esq.
General Manager, North Western Gas Board, St. Helens.

Holmes-Connersville Exhausters at St. Helens

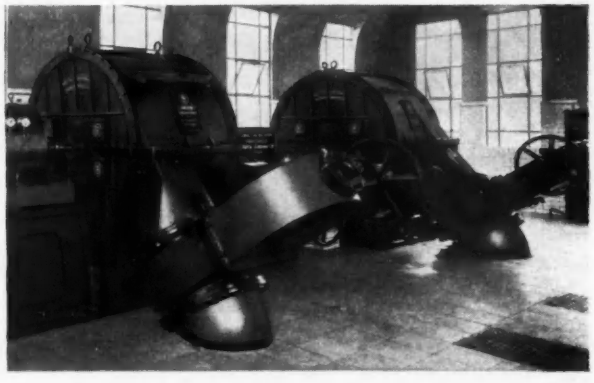
FOUNDED 1850
HOLMES
HUDDERSFIELD

W. C. HOLMES & CO. LTD.
HUDDERSFIELD · LONDON · BIRMINGHAM
Tel: Huddersfield 5280 London: Victoria 9971 Birmingham: Midland 6030

C 4266



Gas Boosters?



EXAMPLES of gas boosting fans with cast iron casings are illustrated here. They represent the results of special attention to the design and development of robust, trouble-free boosters over the years. This experience provides fans for handling volumes of 5,000 to 1½ million cubic feet of gas per hour at pressures up to several pounds per square inch.
When the time comes you'll find there's no easier way to solve your air or gas moving problem than to put it to Keith Blackman.

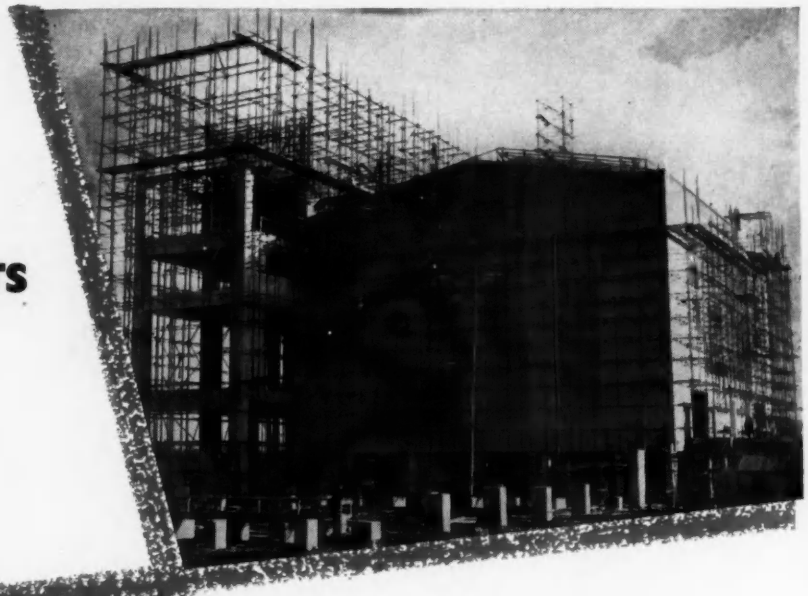
contact **Keith Blackman Ltd**
MILL MEAD ROAD · LONDON · N17 · TOTtenham 4522

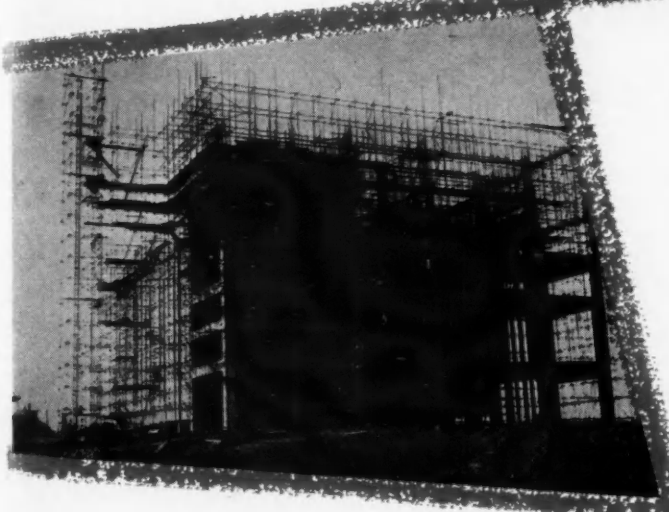
T.A.7225/611

Registered as a Newspaper. Printed by STRAKER BROTHERS LTD., E.C.2 for WALTER KING LIMITED, 11, BOLT COURT, FLEET ST., LONDON, E.C.4, Wednesday, January 5, 1955

C.O.L

INTERMITTENTS AT PRESTON





Two progress photographs of the first half of the ultimate 8,000,000 cu. ft per day installation of C.O.L. Intermittent Vertical Chambers under construction at Lostock Hall Works, Preston, for the North Western Gas Board. Above: First chamber house, with foundation for second house in foreground. Left: Coal and coke bunkers under construction.

(Photograph by courtesy of the North Western Gas Board)

WEST'S

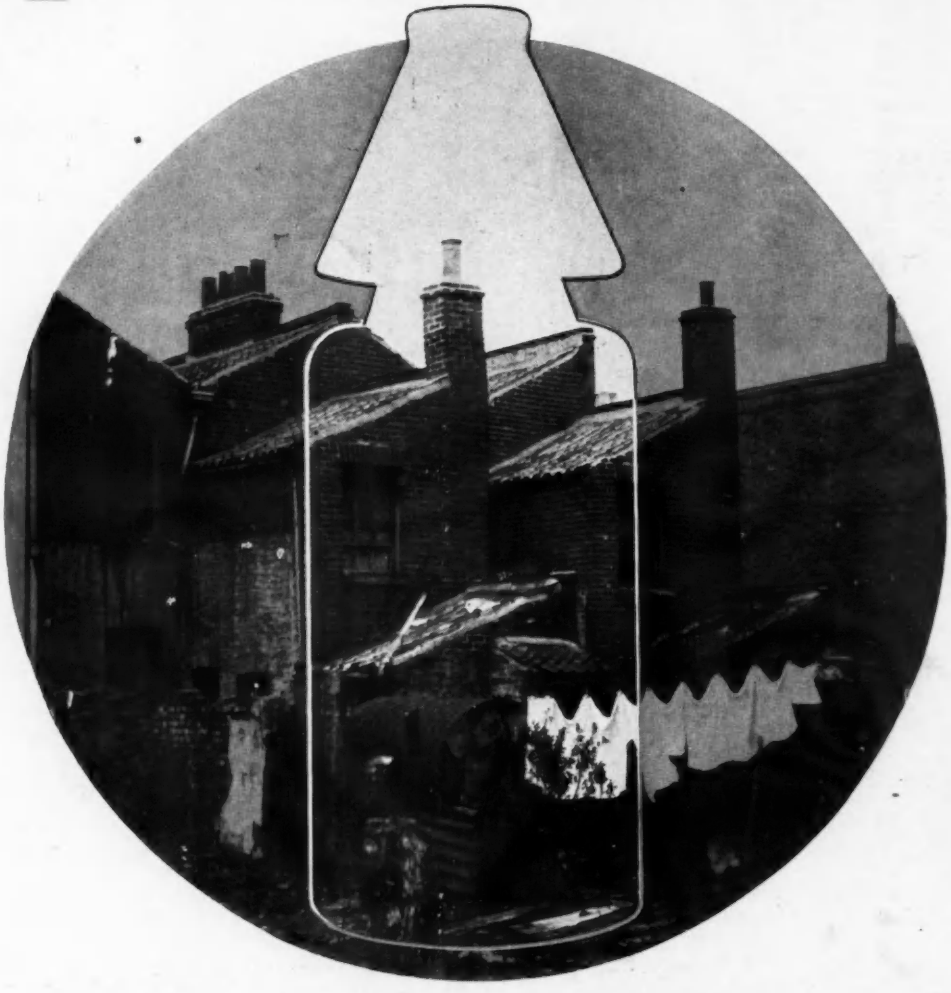
GAS IMPROVEMENT COMPANY LIMITED
(C.O.L. DIVISION)

Chandos House, Buckingham Gate, London S.W.1

Telephone: ABBey 6912

WP1

Operation Rescue



and ASCOT

Since one of the important objectives of Operation Rescue is the provision of a hot water supply, the merits of the Ascot system will come under review when plans for improvement or conversion are considered.

It will be found in many cases that the most economical and efficient method of providing hot water will be an Ascot — a multipoint, a bath water heater, or a sink water heater, or perhaps a combination of the last two.

Ascot heaters are, for the service they give, inexpensive to buy. Often they are cheaper to install than some other popular systems because the pipe runs are simple.

They do not burn raw coal, which is in the interests of the householder, his neighbours, and the whole nation.

Because they heat only the water actually required Ascots are economical in use.

Finally, and really most important, they give the householder a first-class hot water service from which he and his family can get piping hot water instantly day or night in an endless flow. Only of an instantaneous gas water heater can it be said that

It never runs cold

The Ascot Technical Department offers full co-operation, and invites inquiries

ASCOT GAS WATER HEATERS LIMITED · 255 NORTH CIRCULAR ROAD · LONDON · NW10

WHG/A.101